

Vanderbilt University Undergraduate Catalog



VANDERBILT

## **Calendar 2016/2017**

### FALL SEMESTER 2016

Deadline to pay fall charges / Wednesday 17 August  
Classes begin / Wednesday 24 August  
Registration ends / Wednesday 31 August, 11:59 p.m.  
Family Weekend / Friday 23 September–Sunday 25 September  
Fall break / Thursday 13 October–Friday 14 October  
Homecoming and related activities / Sunday 16 October–Saturday 22 October  
Thanksgiving holidays / Saturday 19 November–Sunday 27 November  
Classes end / Thursday 8 December  
Reading days and examinations / Friday 9 December–Saturday 17 December  
Fall semester ends / Saturday 17 December

### SPRING SEMESTER 2017

Deadline to pay spring charges / Tuesday 3 January  
Classes begin / Monday 9 January  
Registration ends / Monday 16 January, 11:59 p.m.  
Spring holidays / Saturday 4 March–Sunday 12 March  
Classes end / Monday 24 April  
Reading days and examinations / Tuesday 25 April–Thursday 4 May  
Commencement / Friday 12 May

### MAYMESTER 2017

Classes begin / Monday 8 May  
Classes end; examinations / Friday 2 June

### SUMMER SESSION 2017

Classes begin / Tuesday 6 June  
Examinations for first-half courses / Friday 7 July  
Second-half courses begin / Tuesday 11 July  
Examinations for second-half and full-term summer courses / Friday 11 August



# Undergraduate Catalog

College of Arts and Science  
Blair School of Music  
School of Engineering  
Peabody College



Vanderbilt  
University  
2016/2017

Containing general information  
and courses of study  
for the 2016/2017 session  
corrected to 17 June 2016  
Nashville

The university reserves the right, through its established procedures, to modify the requirements for admission and graduation and to change other rules, regulations, and provisions, including those stated in this catalog and other publications, and to refuse admission to any student, or to require the withdrawal of a student if it is determined to be in the interest of the student or the university. All students, full- or part-time, who are enrolled in Vanderbilt courses are subject to the same policies. Policies concerning noncurricular matters and concerning withdrawal for medical or emotional reasons can be found in the *Student Handbook*, which is on the Vanderbilt website at [vanderbilt.edu/student\\_handbook](http://vanderbilt.edu/student_handbook).

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# The University

COMMODORE Cornelius Vanderbilt, who gave a million dollars to build and endow Vanderbilt University in 1873, expressed the wish that it “contribute . . . to strengthening the ties which should exist between all geographical sections of our common country.”

A little more than a hundred years later, the Vanderbilt Board of Trust adopted the following mission statement: “We reaffirm our belief in the unique and special contributions that Vanderbilt can make toward meeting the nation’s requirements for scholarly teaching, training, investigation, and service, and we reaffirm our conviction that to fulfill its inherited responsibilities, Vanderbilt must relentlessly pursue a lasting future and seek highest quality in its educational undertakings.”

Today as Vanderbilt pursues its mission, the university more than fulfills the Commodore’s hope. It is one of a few independent universities with both a quality undergraduate program and a full range of graduate and professional programs. It has a strong faculty of more than 3,600 full-time members and a diverse student body of more than 12,700. Students from many regions, backgrounds, and disciplines come together for multidisciplinary study and research.

The 330-acre campus is about one and one-half miles from the downtown business district of the city of Nashville, combining the advantages of an urban location with a peaceful, park-like setting of broad lawns, shaded paths, and quiet plazas.

Off-campus facilities include Vanderbilt Dyer Observatory, situated on a 1,131-foot hill six miles south.

The schools of the university offer the following degrees:

*College of Arts and Science.* Bachelor of Arts.

*Blair School of Music.* Bachelor of Music.

*Divinity School.* Master of Divinity, Master of Theological Studies.

*School of Engineering.* Bachelor of Engineering, Bachelor of Science, Master of Engineering.

*Graduate School.* Master of Arts, Master of Fine Arts, Master of Liberal Arts and Science, Master of Science, Doctor of Philosophy.

*Law School.* Master of Laws, Doctor of Jurisprudence.

*School of Medicine.* Master of Education of the Deaf, Master of Public Health, Master of Science in Clinical Investigation, Master of Laboratory Investigation, Master of Science in Medical Physics, Master of Science (Applied Clinical Informatics, Speech-Language Pathology), Doctor of Audiology, Doctor of Medical Physics, Doctor of Medicine.

*School of Nursing.* Master of Science in Nursing, Doctor of Nursing Practice.

*Owen Graduate School of Management.* Master of Accountancy, Master of Business Administration, Master of Management in Health Care, Master of Marketing, Master of Science in Finance.

*Peabody College.* Bachelor of Science, Master of Education, Master of Public Policy, Doctor of Education.

No honorary degrees are conferred.

## Mission, Goals, and Values

Vanderbilt University is a center for scholarly research, informed and creative teaching, and service to the community and society at large. Vanderbilt will uphold the highest standards and be a leader in the

- quest for new knowledge through scholarship,
- dissemination of knowledge through teaching and outreach,
- creative experimentation of ideas and concepts.

In pursuit of these goals, Vanderbilt values most highly

- intellectual freedom that supports open inquiry,
- equality, compassion, and excellence in all endeavors.

## Accreditation

Vanderbilt University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award bachelor’s, master’s, professional, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call (404) 679-4500, or visit [sacscoc.org](http://sacscoc.org) for questions about the accreditation of Vanderbilt University.

Please contact the commission only in relation to Vanderbilt’s noncompliance with accreditation requirements. Normal inquiries about admission requirements, educational programs, and financial aid should be directed to the university.

## The Libraries

### The Jean and Alexander Heard Library System

Vanderbilt University’s libraries are among the top research libraries in the nation, home to more than nine million items, including print publications, digital collections, film, and other media. The libraries provide electronic access to tens of thousands of full-text journals, more than 1.5 million e-books, data and information resources accessible via the campus network, and authenticated access (VUNetID and e-password) from off campus. The libraries’ website provides a portal to premium and valuable content, information about library services, workshops, programs, exhibits, research guides, and librarian subject specialists.

Library staff teach students valuable academic and lifelong skills for locating and evaluating the latest information in a complex array of sources. Campus libraries are home to professional librarians with subject expertise, who provide help in their discipline. Students can connect with a librarian in person, or ask questions through the library website. Library spaces have options for quiet individual study, which are complemented by group study spaces and instructional rooms, as well as learning commons and cafes. Exhibits throughout the libraries offer intellectual and creative insights that encourage students to see their own work in new ways. Students, faculty, and staff may come to the library to read in a cozy nook, meet friends for group study, grab a quick meal, or see an exhibit.

The oldest manuscript in the library’s collection dates from c. 1300 and new publications are being added every day. Among the libraries’ collection strengths are the W. T. Bandy Center for Baudelaire and Modern French Studies, a

comprehensive collection of materials on Charles Baudelaire and French literature and culture; the Southern Literature and Culture Collection; Latin American collections for Brazil, Colombia, the Andes, Mesoamerica, and Argentina; the Television News Archive, the world's most extensive and complete archive of television news covering 1968 to present; the Revised Common Lectionary, one of the first published web-based resources of scriptural readings for the liturgical year; and the Global Music Archive, a multimedia reference archive and resource center for traditional and popular song, music, and dance of Africa and the Americas.

### Information Technology

Vanderbilt University Information Technology (VUIT) offers voice, video, data, computing, and conferencing services to Vanderbilt students, faculty, and staff, and provides free antivirus downloads and malware prevention in the residence halls and many campus areas.

VUIT maintains and supports VUNet, the campuswide data network that provides access to the internet, and AccessVU, the authentication service that enables Vanderbilt users to securely identify themselves to many services on VUNet. Those services include YES, Your Enrollment Services; Blackboard; and VU Gmail, the university's email system of choice for Vanderbilt undergraduates.

It is important to note that many wireless consumer electronic devices interfere with VUNet, and in worst-case circumstances, could even cause degradation to network service. These devices are prohibited and include, but are not limited to, routers, access points (APs), or AirPorts manufactured by companies such as Apple, Belkin, D-Link, and Linksys. Additionally, settings for smartphone hotspots and wireless connectivity for printers and other devices must be disabled to prevent interference with university wireless APs.

VUIT partners with Sprint, Verizon, and AT&T to offer discounts for cellular phone service. For discount information see [it.vanderbilt.edu/cellphone](http://it.vanderbilt.edu/cellphone).

Vanderbilt offers all students low-cost and free-of-charge software, including Microsoft Office and Microsoft Windows. See [softwarestore.vanderbilt.edu](http://softwarestore.vanderbilt.edu) for a complete product catalog and more information.

For campus residents, VUIT supports ResNet, which provides a direct connection to VUNet and the internet. Cable television ports are provided in each campus residence.

VUIT offers various conferencing and collaboration services for students. In addition to Gmail at Vanderbilt, undergraduates can enjoy Google drive and Google hangouts (among other Google services) at [gmail.vanderbilt.edu](mailto:gmail.vanderbilt.edu). Audio and video conferencing are also available. See [it.vanderbilt.edu/services/collaboration](http://it.vanderbilt.edu/services/collaboration) for more information.

The Tech Hub provides information to students, faculty, and staff about VUNet and VUNet services. Tech Hub locations, hours, contacts, and other information can be found at [it.vanderbilt.edu/techhub](http://it.vanderbilt.edu/techhub).

For more information on IT services and computing at Vanderbilt, go to [it.vanderbilt.edu](http://it.vanderbilt.edu).

### Commencement

The university holds its annual Commencement ceremony following the spring semester. Degree candidates must have completed successfully all curriculum requirements and have passed all prescribed examinations by the published deadlines to be allowed to participate in the ceremony. A student completing degree requirements in the summer or fall semester will be invited to participate in Commencement the following May; however, the semester in which the degree was actually earned will be the one recorded on the diploma and the student's permanent record. Financially clear students unable to participate in the graduation ceremony will receive their diplomas by mail. Please refer to the Commencement webpage at [vanderbilt.edu/commencement](http://vanderbilt.edu/commencement) for complete information on the May ceremony.

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# Special Programs for Undergraduates

## Study Abroad

Vanderbilt offers study abroad opportunities for all undergraduate students from the College of Arts and Science, Blair School of Music, School of Engineering, and Peabody College. Programs are available for the semester, full academic year, summer, and Maymester. Students may study abroad any time after their freshman year at Vanderbilt. Through Vanderbilt study abroad programs with our own resident directors and through additional programs provided by agreements with other universities and providers, Vanderbilt students can take direct credit courses in Argentina, Australia, Austria, Brazil, Canada, Chile, China, the Czech Republic, Denmark, the Dominican Republic, Egypt, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Jordan, Kenya, Morocco, Nepal, the Netherlands, New Zealand, Russia, Samoa, Senegal, Serbia, Singapore, South Africa, Spain, Switzerland, Uganda, the United Kingdom, and Vietnam.

Study abroad programs are open to students in good academic, financial, and disciplinary standing, with an overall grade point average of 2.700 or better, or a grade point average at this level in each of the two most recent semesters. Many programs require a higher grade point average and, with the exception of Vanderbilt's program in France, the student's application must also be approved by the appropriate host university, institute, or consortium. Study abroad programs that are either managed by or approved by Vanderbilt offer direct credit toward the Vanderbilt degree. With the exception of AXLE credit, hours earned through these programs and approved in advance by the appropriate department are treated as if earned on the Nashville campus and serve to satisfy the residence requirement (see the chapter on Academic Regulations).

Students studying on Vanderbilt programs or Vanderbilt-approved programs for the academic year or semester are eligible for federal and VU financial aid. This includes merit scholarships but excludes work-study. All participants in direct-credit programs are billed through Vanderbilt Student Accounts and must pay Vanderbilt tuition and a program fee, which includes housing in addition to an activity fee and international health insurance.

It should be noted, however, that if a program has been approved for direct credit by Vanderbilt, it must be taken for direct credit by matriculated Vanderbilt students. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved direct-credit program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt. Other study abroad programs may be approved for transfer credit by the dean of the student's college/school. Information is available from the Global Education Office (GEO), Suite 115, Student Life Center, and at [vanderbilt.edu/geo](http://vanderbilt.edu/geo).

## Vanderbilt Programs and Exchange Programs

The oldest Vanderbilt study abroad program is in Aix-en-Provence, France. Vanderbilt in France gives students the opportunity to develop or acquire French skills while also taking French- or English-language courses in a variety of subjects. Residence in France may be for the academic year, the fall or spring semester, or the summer.

A range of exchange programs offer students an opportunity to study at a partner university. The Institut d'Études Politiques in Paris is a world-renowned institution for study of the social sciences, where Vanderbilt students can learn alongside peers from France and all around the world. At the Politecnico di Torino in Italy, mechanical engineering students can take a variety of courses focused on interdisciplinary and technical excellence. Through the Killam Fellowships Program, administered by Fulbright Canada, students can spend either a semester or a full academic year as an exchange student at one of more than fifteen universities in Canada. At City University of Hong Kong and the Hong Kong University of Science and Technology, engineering students can take courses in engineering, science, and other disciplines in a fast-growing and international city. Budapest University of Technology and Economics offers courses in new interdisciplinary engineering fields. In the Netherlands, Utrecht University and its two honors colleges offer English-language course work in a variety of disciplines including history, economics, math, and the social sciences. Australia's University of Melbourne offers a full selection of courses, including courses through the Victorian College of the Arts and Music. At the National University of Singapore, students may receive credit in a variety of engineering disciplines. For a complete list of exchange programs, visit [vanderbilt.edu/geo](http://vanderbilt.edu/geo).

In addition, programs are offered via direct enrollment at the University of the Balearic Islands in Palma de Mallorca, Spain; at American University in Cairo, Egypt; at Hebrew University in Jerusalem, Israel; in Metz, France, for engineering students in affiliation with the Georgia Institute of Technology (Georgia Tech); in Dresden, Germany, for engineering students in affiliation with Boston University; and in Rome, Italy, through the Intercollegiate Center for Classical Studies (ICCS). The ICCS is a consortium of thirty-seven universities and colleges and is open only to majors in the Departments of Classical Studies and History of Art. Applications for all of the listed programs are processed through the Global Education Office (GEO). Visit [vanderbilt.edu/geo](http://vanderbilt.edu/geo).

## Vanderbilt-Approved Programs

Through arrangements with the Council on International Educational Exchange (CIEE), CET Academic Programs (CET), the Danish Institute for Study Abroad (DIS), Institute for the International Education of Students (IES), the Institute for Study Abroad (IFSA) at Butler University, Frontiers Abroad, the Alliance for Global Education (AGE), and the School for International Training (SIT), Vanderbilt students may select from a wide range of study abroad opportunities.

The Council on International Educational Exchange (CIEE) offers programs with a focus on cultural immersion in Australia, Argentina, Brazil, Chile, China, the Dominican Republic, Japan, Russia, Senegal, South Africa, and Spain. CET sponsors Vanderbilt-approved programs in Beijing, Harbin, Kunming, and Shanghai, China, in Florence and Siena, Italy, and in Prague, Czech Republic. DIS Copenhagen offers course work in English in multiple subject areas, including European culture and history, politics and society, international business and economics, medical practice and policy, marine and environmental biology,

psychology and child development, and more. Through the IES programs in Vienna, Austria, and Amsterdam, the Netherlands, qualified students can pursue course work in music studies (performance, composition, history, and theory) as well as other disciplines. Through IFSA Butler, qualified students can study in Australia, England, Ireland, New Zealand, Northern Ireland, and Scotland. Frontiers Abroad offers Vanderbilt students the opportunity to study earth and environmental sciences in New Zealand, both in classrooms at the University of Auckland or the University of Canterbury and in field camp courses and on research projects. Through AGE, students may take course work in the social sciences in Pune, India. Programs offered by SIT in Brazil, Chile, India, Jordan, Kenya, Morocco, Nepal, Samoa, Serbia, Switzerland, Uganda, and Vietnam are centered on independent research projects. For a complete list of approved programs, visit [vanderbilt.edu/geo](http://vanderbilt.edu/geo).

## Vanderbilt Experiential Learning Programs

The Office of Active Citizenship and Service (OACS) offers a number of global and domestic experiential learning programs. These programs offer students opportunities to volunteer in Nashville, to develop leadership skills through organizational management, to improve foreign language proficiency, and to work with NGOs in the U.S. and abroad. For specific information about the different programs, contact OACS in 304 Sarratt Student Center|Rand Hall or visit [vanderbilt.edu/oacs/programs](http://vanderbilt.edu/oacs/programs).

## Joint and Dual Programs

Vanderbilt undergraduates in Blair School of Music, School of Engineering, and Peabody College take their background liberal arts and science courses in the College of Arts and Science—and may take other elective courses in these areas as individual degree programs will allow. In like manner, students in the College of Arts and Science may take courses in the other schools for regular credit toward the liberal arts degree. Students may earn a second major or minor outside of their school, as well.

Several dual programs, combining undergraduate study with work toward a master's degree, may make possible saving a year in the time required to complete both degrees. Details of the various dual programs will be found in the appropriate school sections of this catalog.

## Preparation for Careers in the Health Professions

Study programs leading to careers in medicine, dentistry, veterinary science, pharmacy science, and many related areas are under the general supervision of Professor Michelle Grundy, director of the Health Professions Advisory Office.

### Medicine

There is no formal premedical program of courses at Vanderbilt. Each student should plan a program to meet individual requirements. Premedical studies should include whatever courses may be necessary to meet medical school admission requirements and to satisfy the requirements of the student's undergraduate degree program. Students interested in premedical studies should plan their undergraduate programs in consultation with Professor Grundy and their primary

academic adviser. Details of the 2015 MCAT and additional useful information are at [as.vanderbilt.edu/hpao](http://as.vanderbilt.edu/hpao).

Students are encouraged to consult the directory *Medical School Admission Requirements: United States and Canada*, published online by the Association of American Medical Colleges, as a guide to planning their undergraduate programs. A link to the guide can be found on the HPAO website. Additional information on preparation for medical study can be found in the College of Arts and Science section of this book.

See the *Vanderbilt University School of Medicine Catalog* for the official statement on minimum requirements for admission to Vanderbilt University School of Medicine. There is no course of study that will ensure admission.

### Nursing

Students interested in nursing may earn both a baccalaureate degree in a non-nursing major and a master of science in nursing (M.S.N.) degree in five calendar years. Interested students apply for admission to either the College of Arts and Science or Peabody College and indicate on their applications that pre-nursing is their intended program of studies. In addition to their faculty advisers in the College of Arts and Science or Peabody, pre-nursing students will be assigned faculty advisers in the School of Nursing to assist them in planning their program of studies.

Pre-nursing students in the College of Arts and Science obtain both the baccalaureate degree and the M.S.N. degree by combining three and one-half years (a minimum of 105 earned hours) of study in the College of Arts and Science with six semesters of study in the School of Nursing. Students will receive the baccalaureate from the College of Arts and Science at the end of the eighth semester under the senior-in-absentia program, and the M.S.N. from the School of Nursing after completing a minimum of five additional consecutive semesters of study. This program of study requires that students complete the general curriculum requirements (including AXLE and major) for the baccalaureate degree and satisfy the prerequisite courses for admission to the School of Nursing. The first three semesters in nursing are accelerated generalist nursing courses and serve as a "bridge" into the Master of Science in Nursing program by preparing students for the NCLEX exam to become a Registered Nurse (R.N.). These courses also provide the foundation equivalent to the bachelor's degree in nursing for course work in the selected nursing specialty. Upon completion of three semesters of pre-specialty courses, students enter a minimum of an additional three-semester sequence of courses in their declared specialty in order to earn the M.S.N. degree.

Students must apply to the School of Nursing and to the Administrative Committee of the College of Arts and Science for admission to the senior-in-absentia program by November 1 of their junior year. Students are subject to all School of Nursing admission requirements, and no student is assured of admission to the School of Nursing. Up to 16 hours of School of Nursing courses approved by the College of Arts and Science may be counted toward completion of the undergraduate degree. Upon acceptance to the School of Nursing, students will be assigned an adviser and should schedule an advising appointment.

Pre-nursing students at Peabody College may either (a) complete a major in child development and earn a B.S. through a senior-in-absentia program or (b) complete a major in human and organizational development and earn a B.S. through a senior-in-absentia program. Upon admission to

the School of Nursing, the student is required to complete six semesters (two calendar years) of full-time study to earn the M.S.N. Additional information may be found in the Peabody College section of this catalog.

*Admission to the Graduate Nursing Program.* Prior to admission to the School of Nursing, applicants must have completed prerequisite courses, including the following:

A required introductory course in statistics that includes descriptive and inferential statistical techniques; Mathematics 1010–1011, Mathematics 2820, or Peabody Psychology 2110 will fulfill this requirement.

*Eleven hours of natural science courses.* Courses in human anatomy and physiology (Nursing 3101 and 3102) and microbiology (Nursing 1500) are required.

Three hours of lifespan development are required. Human and Organizational Development 1250, Applied Human Development; or Peabody Psychology 1250, Developmental Psychology, will fulfill the lifespan development requirement.

Two hours of nutrition are required. Nursing 1601, Introduction to Nutritional Health, fulfills the requirement for nutrition.

Admission to the School of Nursing is competitive. Consult the School of Nursing catalog for specific requirements and admission procedures. Students are encouraged to write or call the School of Nursing's Office of Admissions, 217 Godchaux Hall, Nashville, Tennessee 37240, (615) 322-3800, or see the website, [nursing.vanderbilt.edu](http://nursing.vanderbilt.edu), for further explanation of pre-nursing and graduate nursing programs.

## Preparation for Other Professional Careers

### Architecture, Law, and Journalism

Undergraduate students expecting to pursue architecture, law, or journalism at the graduate level may earn any major at Vanderbilt, but should be aware of graduate field requirements. See the chapter on Special Programs in the College of Arts and Science section of this catalog.

### Teacher Licensure Programs

Vanderbilt offers programs through Peabody College leading to licensure for teaching. Students seeking teacher licensure should refer to the Peabody College section of this catalog. Students seeking licensure in music should see the Blair School of Music section of this catalog.

Undergraduate students in the College of Arts and Science, Blair School of Music, the School of Engineering, or Peabody College who are seeking licensure in early childhood, elementary, or secondary education must complete a major outside of teacher education and a Peabody College education major. Licensure in special education fields does not require a second major.

## Officer Education Programs

### Air Force Reserve Officer Training Corps (AFROTC)

Currently there is no charge for tuition to take Air Force ROTC. The grade and credit can transfer back for graduation.

The Air Force Reserve Officer Training Corps (AFROTC) provides pre-commission training for college men and women

who desire to serve as commissioned officers in the United States Air Force. When combined with the academic disciplines offered at the college level, the program provides the student a broad-based knowledge of management, leadership, and technical skills required for a commission and subsequent active-duty service in the Air Force.

Graduates are commissioned as Second Lieutenants and will enter active duty. The main objectives of producing officers through the AFROTC program are (1) to procure officers with a broad educational base, (2) to provide a basic military education for college students, (3) to teach fundamentals and techniques of leadership, management, and decision making, and (4) to develop, in conjunction with other academic disciplines, individual character and attributes required of a commissioned officer in the United States Air Force.

### AFROTC Program/Scholarships

*Enrolling in AFROTC.* Please go to [www.tnstate.edu/afrotc](http://www.tnstate.edu/afrotc) for application deadlines. Vanderbilt University students may participate in the Air Force ROTC program in cooperation with Tennessee State University. Call Detachment 790, (615) 963-5980, and ask for a Cross-Town Application. Mail this application and your official transcripts with your immunization records back to Detachment 790. The program provides training and education that will develop skills and attitudes vital to the professional Air Force officer. In this program students are eligible to compete for scholarships (2.5+ GPA) that cover the cost of tuition and textbooks. Additionally, Vanderbilt University offers a generous stipend to all AFROTC cadets.

*Curriculum.* The General Military Course (GMC) is 1 credit hour and is composed of the first four semesters of aerospace studies (AERO) and is for freshmen and sophomores. The Professional Officer Course (POC) is 3 credit hours and constitutes the final four semesters of AFROTC study and enrolls juniors and seniors. The Leadership Lab is also 1 credit hour.

Students who participate in the Air Force ROTC program must be enrolled at Vanderbilt University. The student is also jointly enrolled as a TSU student and participates in Aerospace Studies (Air Force ROTC) at TSU. For more information, contact the unit admissions officer at (615) 963-5931/5979 or check our website at [www.tnstate.edu/afrotc](http://www.tnstate.edu/afrotc).

### General Benefits

All students enrolled in the AFROTC program are provided textbooks and uniforms at no expense. Professional Officer Course (POC) students (juniors and seniors) and all scholarship students receive a monthly subsistence allowance of up to \$500 tax-free.

### Sponsored Activities

Arnold Air Society is a national society of AFROTC cadets who excel in character and academics and exhibit interests in the study of aerospace technology. The group meets at TSU.

Professional Development Training is provided during the summers to cadets interested in enhancing their knowledge of Air Force leadership and management opportunities, increasing their cultural awareness, and learning about specific career specialties.

AFROTC Flight Orientation Program is designed to allow all cadets, regardless of intended career field, the chance to fly as front seat or back seat passengers in Civil Air Patrol aircraft. Everyone can experience the joy of flight.

## Aerospace Studies Courses at TSU

### FRESHMAN YEAR

Foundations of the United States Air Force

### SOPHOMORE YEAR

Air Power History

### JUNIOR YEAR

Air Force Leadership Studies

### SENIOR YEAR

National Security Affairs/Preparation for Active Duty

## Army Reserve Officers' Training Corps (ROTC)

The Army Reserve Officers' Training Corps (ROTC) is a sequential and progressive academic program that provides pre-commission training for college-educated men and women who desire to serve as commissioned officers in the active Army, Army Reserve, and Army National Guard. As the Army's largest commissioning source, it fulfills a vital role in providing mature young men and women for leadership and management positions in an increasingly technological Army. Admission is open to both men and women who meet mental, moral, and physical qualifications.

Training goes beyond the typical college classroom and is designed to build individual confidence and self-discipline, instill values and ethics, and develop leadership skills. The course load consists of one course per semester. Each succeeding year will address course topics in greater depth as students receive feedback on their leadership style and assume positions of greater responsibility within the program. Graduates are commissioned as Second Lieutenants and will enter active duty with follow-on employment in the Army Reserves, National Guard, or active duty. Educational delays may be granted for graduates who desire to pursue advanced degrees prior to entry on active duty.

All university students in the Nashville area may participate in the Army ROTC program at Vanderbilt University. While Vanderbilt serves as the host university, students at partnership schools are not charged additional tuition to take military science courses. Grades are transferred back to each university and added to the students' transcripts.

**Scholarships.** Students can earn merit scholarships in several ways. High school seniors and graduates compete for four-year scholarships that are determined by local competition among Vanderbilt applicants. Although determined locally, the application process is centrally managed. Scholarship students receive financial benefits that cover the cost of full tuition scholarships each year, an annual \$1,200 book allowance, all uniforms, and a monthly tax-free stipend beginning at \$300 for freshmen and increasing to \$500 for seniors. Vanderbilt University also provides Vanderbilt ROTC scholarship students an additional \$6,000 tuition grant each year for room and board. Students who are not on scholarship receive the monthly stipend during their junior and senior years. All students enrolled in the Army ROTC program are provided textbooks and uniforms at no expense. Contracted non-scholarship students also receive the monthly stipend from \$300 to \$500 depending on the academic level. For more information, see the website at [goarmy.com/rotc.html](http://goarmy.com/rotc.html).

**Summer training.** Students have the opportunity to attend several training events over the summer.

**Cadet Leader Course (CLC)** — This five-week leadership exercise at Fort Knox, Kentucky, is a commissioning requirement. This is normally done between the junior and senior years. Travel, room, and board are provided free, and cadets

are paid approximately \$700.

**Cultural Understanding and Language Program (CULP) Internships** — Students are encouraged to spend a semester, special or summer session in academic studies abroad if feasible. Special incentives are available to further attract qualified students to these valuable programs.

**Cadet Troop and Leadership Training Internships (CTLT)** — CTLT Internships are leadership development opportunities for students who are placed with military organizations throughout the world to gain perspective and understanding on the role of the military officer.

**Cadet Professional Field Training (CPFT)** — Airborne, Air Assault, Mountain Warfare, Robin Sage (U.S. Special Forces), Helicopter Flight Training, and Sapper.

Other training opportunities exist for qualified applicants who are interested.

**Commissioning and career opportunities.** A commission in the U.S. Army is a distinctive honor earned through hard work, demonstrated commitment, and a desire to serve the nation. Post-graduate military education, usually starting within six months of graduation and commissioning and continuing through the officer's service career, begins with the basic officer leadership course followed by officer basic course that qualify new lieutenants in their specific branch of service. Education delays are available for critical specialties requiring postgraduate civilian education such as law and medical degrees.

**Course credit.** During the four-year program, Army ROTC students complete eight courses of military science plus associated labs. Academic credit varies by university.

**Vanderbilt University College Credit:** All AROTC courses count toward elective credit. See course descriptions below.

**Information.** Inquiries regarding enrollment in the Army ROTC program should be made to the Army ROTC Admissions Officer at (615) 322-8550 or (800) 288-7682 (1-800-VUROTC). Also see [vanderbilt.edu/army](http://vanderbilt.edu/army).

## Military Science Department

COMMANDING OFFICER Brian D. Gilbert

MILITARY INSTRUCTORS Brian D. Gilbert, Gabriel C. Cleveland

## Military Science Courses

During the four-year program, Army ROTC students complete eight courses of military science plus associated labs, and must complete an American Military History course and LDAC.

### FIRST YEAR

**MS-PC 1210. Leadership and Personal Development.** (Formerly MS 111). Leadership is one of the most compelling topics of our time, and might be one of the most important attributes for effectiveness in all levels of human endeavor. The success of one of the most admired and respected institutions in our country, the military, is founded upon the understanding and effective application of leadership, and the development of leaders. This course introduces students to the personal challenges and competencies that are critical to effective leadership. The focus is on developing basic knowledge and comprehension of leadership attributes and core leader competencies in a universal setting and exploring potential applications of these principles and practices at Vanderbilt, in the military and in the corporate world. [1]

**MS-PC 1210L. Leadership and Personal Development Lab.** (Formerly MS 111a). Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations. Within the military science curriculum, this process is called the Leadership Development Program (LDP), modeled after the principles spelled out in Field Manual 22-100,

*Army Leadership*, and is standardized both on campus and in Leadership Development and Assessment Course (LDAC) environments. The flexible methodology of LDP accommodates personalized, individual development at all levels of proficiency throughout the officer educational experience, from program entry to commissioning. The LDP includes basic leadership training, periodic assessment and counseling at both team and individual levels by experienced observers. Trends and deficiencies are identified and addressed with retraining and reassessment in a continuous cycle. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. Student performance in leadership roles is assessed and notable strengths and weaknesses are identified. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

**MS-PC 1230. Leadership and Personal Development II.** (Formerly MS 113). What motivates others to follow a person is intriguing, inspiring and alluring. Through routine observation, we learn from leaders regardless of the setting (military, business, education, etc.). Leadership and Personal Development II provides an overview of leadership fundamentals such as setting direction, problem solving, listening and providing feedback. You will explore dimensions of leadership, values, attributes, skills, and actions in a military context through practical, hands-on, and interactive exercises. [1]

**MS-PC 1230L. Leadership and Personal Development II Lab.** (Formerly MS 113a). Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations; this process is called the Leadership Development Program. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

#### SOPHOMORE YEAR

One American Military History course, chosen from the following:

**HIST 1730. The U.S. and the Cold War.**

**HIST 1740. The U.S. and the Vietnam War.**

**HIST 2720. World War II.**

**MS-PC 1510. American Military History: Principles of War.**  
Offered on a pass/fail basis only. [3]

**PSCI 3272W. The War in Iraq, 2003–2011.**

**MS-PC 2150. Foundations of Leadership.** MS-PC 2150 introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for future commissioned Army officers. This class is broken down into five key skills development areas: 1) values and ethics, 2) personal development, 3) officership, 4) leadership, and 5) tactics and techniques. The class emphasizes individual leadership values and characteristics with a focus on Leadership Theory and Interpersonal Communications, Army Values, Troop Leading Procedures, Problem Solving, and Team Building in a military environment. [2]

**MS-PC 2150L. Foundations of Leadership Lab.** (Formerly MS-PC 150a). This lab builds upon the classroom topics in MS-PC 2150 and introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for future commissioned Army officers. The lab is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. The lab emphasizes individual leadership values and characteristics with a focus on leadership theory and interpersonal communications, Army values, troop leading procedures, problem solving, and team building in a military environment. [1]

**MS-PC 2160. Foundations of Tactical Leadership.** (Formerly MS 152). MS-PC 2160 builds upon MS-PC 2150. The class is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. During this class we will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [2]

**MS-PC 2160L. Foundations of Tactical Leadership Lab.** (Formerly MS 152a). MS-PC 2160L builds upon MS-PC 2150 and MS-PC 2150L. The lab is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. During the lab we will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [1]

#### JUNIOR YEAR

**MS-PC 3110. Leadership and Problem Solving.** (Formerly MS 211). This course builds upon your skills developed in MS-PC 2160 and continues to develop leadership, officership skills, self-awareness, and critical thinking skills through challenging scenarios related to small-unit tactical operations. Cadets receive systematic and specific feedback on their leadership values, attributes, skills, and actions. Prerequisite: MS-PC 1210 (111), 1230 (113), 2150 (150), and 2160 (152). [3]

**MS-PC 3120. Applied Team Leadership.** (Formerly MS 212). Challenging scenarios related to small-unit tactical operations are used to develop self-awareness and critical thinking skills. Students receive systematic and specific feedback on their leadership values, attributes, skills, and actions. Prerequisite: MS-PC 3110. [3]

#### SUMMER BETWEEN JUNIOR AND SENIOR YEAR

*Cadet Leader Course (1 Cr)* — All students pursuing a commission as an Army Officer must complete the Cadet Leader Course (CLC) during the summer between their junior and senior year. Students may apply for 1 credit hour of academic credit with the designation of interdisciplinary internship (INDS 3881). This course may be taken once and repeated once for a maximum of 2 credits on a Pass/Fail basis only.

#### SENIOR YEAR

**MS-PC 4150. Leadership and Ethics.** (Formerly MS 251). Students develop proficiency in planning, executing, and assessing complex operations, functioning as a member of a staff, and providing leadership-performance feedback to subordinates. Students are given situational opportunities to assess risk, make sound ethical decisions, and provide coaching and mentoring to fellow ROTC Cadets. Prerequisite: MS-PC 3120. [3]

**MS-PC 4160. Leadership in a Complex World.** (Formerly MS 252). This course explores the dynamics of leading in the complex situations of current military operations in the contemporary operating environment. It introduces the concept of culture, its components, how culture influences human behavior, the impact of culturally influenced behavior on military operations, and how to analyze and apply cultural considerations in the planning and execution of military operations. Prerequisite: MS-PC 4150. [3]

## Naval Reserve Officer Training Corps (NROTC)

The Naval Reserve Officer Training Corps (NROTC) unit at Vanderbilt conducts the Naval Officer Education program.

Challenging academic courses and experience-building events prepare a select group of highly accomplished students for the opportunity to serve their country as a Navy or Marine Corps officer and receive an education. The primary focus of the NROTC program is to develop the most capable leaders possible by building upon the academic strength of Vanderbilt and providing essential military and leadership education.

Students participate in the NROTC unit in the scholarship program, the college program, or the naval science program. College Program students take the prescribed naval science course each semester, participate weekly in naval science lab, and engage in summer training programs after each academic year. The NROTC College Program is identical to the scholarship program except for tuition financial benefit and that students only participate in summer training upon completion of their junior academic year. Also, any Vanderbilt student may take any or all of the naval science courses without participating in naval science lab or summer training.

Scholarship students receive tuition, fees, uniforms, \$375 per semester for textbooks, and a monthly stipend beginning at \$250 for freshmen and increasing to \$400 for seniors. Vanderbilt may provide scholarship students with up to a \$6,000-per-year stipend toward room and board. College Program students are provided uniforms, textbooks for naval science courses, and a monthly stipend of \$350 upon commencement of their junior year with approval by higher authority based on academic performance and military aptitude.

**Scholarships.** Students can earn scholarships in several ways. Four-year scholarships are determined by national competition among high school seniors and graduates. Based on the national ranking, students may be awarded a scholarship that covers full tuition. To be eligible, applicants must have less than 30 semester hours of college credit. College Program students can also be nominated for three- and two-year scholarships by the NROTC unit. These nominations are based on the students' academic and military performance at the college level. Sophomores not enrolled in the College Program are eligible to apply for the two-year NROTC scholarship program. This is a national competition and application is made through the NROTC unit.

**Service obligation.** For most students at the beginning of their sophomore year, should they choose to continue with the NROTC program, Navy option scholarship students incur a minimum service obligation of five years active duty, and Marine option scholarship students incur a minimum service obligation of four years of active duty, to be served upon graduation or withdrawal from the program. College Program students incur a three-year active duty commitment upon graduation or withdrawal from the program. Additional requirements may be required for specific job assignments.

**Summer training.** Summer training for three to four weeks is conducted aboard naval vessels and naval shore stations after each of the first three academic years. Scholarship students are normally required to participate each year. All scholarship and College Program midshipmen are required to participate in summer training prior to their final academic year.

**Course credit.** During the four-year program, NROTC Navy-option students are required to complete eight courses (24 hours) of naval science, and Marine-option students are required to complete six courses (18 hours) of naval science. Academic credit awarded varies by course and is outlined in the course descriptions below.

**Required Courses for Navy/Marine Scholarship.** The following courses are required for students on scholarship:

Calculus (Navy option only) (6 credits minimum): Mathematics 1200–1201, or 1300–1301 completed by the end of the sophomore year.

Physics (Navy option only) (6 credits): 1501–1502 or 1601–1602 completed by the end of the junior year.

English (6 credits): Two semesters of any English course or courses containing a designated writing component.

American History/National Security Policy (3 credits):

Contact the Naval ROTC unit for a listing of courses fulfilling this requirement.

World Culture/Regional Studies (Navy option only) (3 credits): Contact the Naval ROTC unit for a listing of courses fulfilling this requirement.

**Information.** Inquiries regarding enrollment in the Naval ROTC program should be made to the Naval ROTC unit recruiting officer at (615) 322-2671 or (800) 288-01183, or by contacting a local Navy or Marine Corps recruiting station.

Admission to the program is open to both men and women. Physical qualification to Naval Service standards is required.

## Naval Science

COMMANDING OFFICER Ted Heflin

EXECUTIVE OFFICER Samuel Brasfield

MARINE INSTRUCTOR David Wood

NAVAL INSTRUCTORS Tyler McClean, Jesse Ochoa, John Underhill

## Naval Science Courses

For Navy-option NROTC students, the following naval science courses are required for commissioning: NS 1100, HIST 1690, NS 2410, ES 3231, ES 3230, ES 3232, ES 4233, and NS-PC 4242 and their appropriate labs. For Marine-option NROTC students, the following naval science courses are required for commissioning: NS 1100, HIST 1690, NS 2410, HIST 1692, HIST 1691, and NS-PC 4242 and their appropriate labs. For all courses listed below, the associated lab sections are intended for NROTC students only.

### FIRST YEAR

**NS 1100. Introduction to Naval Science.** No credit toward current degree. [3]

**HIST 1690. Sea Power in History.** An introductory survey of the U.S. Navy's role in foreign and defense policies from the American Revolution to the present. The course also examines the broad principles, concepts, and elements of sea power throughout history. Key points will include technological advances, interservice relations, strategies, and governmental policies pertaining to sea power. This course is designed to meet the NROTC requirement. SPRING. [3] (US)

### SOPHOMORE YEAR

**NS-PC 2410. Organization and Management.** (Formerly NS 241). This course presents a comprehensive study of organizational behavior and management with special emphasis on situational leadership in the military and civilian sectors and the development of your skills in organizational thinking and problem solving. You will explore a variety of leadership and management topics, including the classical theories of management, motivation, and communication. FALL. [3]

**ES 3231. Navigation.** (Formerly NS 231). Naval piloting procedures. Charts, visual and electronic aids, and theory and operation of magnetic and gyro compasses; inland and international rules of the nautical road. The celestial coordinate system, including spherical trigonometry

and application for navigation at sea. Environmental influences on naval operations. SPRING. [3]

#### JUNIOR YEAR

**ES 3230. Ships Engineering Systems.** (Formerly NS 230). Ship characteristics and types, including design and control, propulsion, hydrodynamic forces, stability, compartmentation, and electrical and auxiliary systems. Theory and design of steam, gas turbine, and nuclear propulsion. FALL. [3]

**ES 3232. Ships Weapons Systems.** (Formerly NS 232). Theory and employment of weapons systems, including the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. Fire control systems and major weapons types, including capabilities and limitations. Physical aspects of radar and underwater sound. Command, control, communications, computers, cyber intelligence, surveillance, and reconnaissance. SPRING. [3]

#### SENIOR YEAR

**ES 3233. Naval Operations.** (Formerly NS 233). A continued study of relative motion, formation tactics and ship employment. Introduction to Naval operations and operations analysis. Ship behavior and characteristics in maneuvering. Applied aspects of ship handling, afloat communications, naval command and control, naval warfare areas, and joint warfare are also included. FALL. [3]

**NS-PC 4242. Leadership and Ethics.** (Formerly NS-PC 242). An exploration of major Western ethical philosophy in the development and application of leadership to enhance objective, sound and timely decision-making in the most challenging of environments. This course follows theoretical examination with case studies and practical application to emphasize the importance of ethical reasoning to leadership, and explores components of character and integrity in decision making. SPRING. [3]

The Marine option courses listed below are taught in the spring, rotating on a yearly basis. They are taken in the sophomore and junior year.

**History 1692. Evolution of Warfare.** (Formerly NS 2311). Antiquity to the present. Evolution of strategic principles. Influence of technological, economic, moral, psychological, and political factors. Case studies from a soldier's perspective. [3] (No AXLE credit)

**History 1693. Fundamentals of Maneuver Warfare.** (Replaces HIST 1692 Amphibious Warfare). Broad aspects of warfare and their interactions with maneuver warfare doctrine. Specific focus on the United States Marine Corps as the premier maneuver warfare fighting institution. Historical influences on current tactical, operational, and strategic implications of maneuver warfare practices in current and future operations. Case studies. Enrollment preference to NROTC students. Repeat credit for students who have completed HIST 169D or HIST 1692. [3]

## Interdisciplinary Centers, Institutes, and Research Groups

Vanderbilt actively promotes research and teaching that cross disciplines, departments, and institutional lines through a multitude of centers, institutes, and research groups. Below is a sampling of Vanderbilt's interdisciplinary initiatives. For more information, see [research.vanderbilt.edu/centers-institutes](http://research.vanderbilt.edu/centers-institutes).

**The Cal Turner Program for Moral Leadership in the Professions** works to develop the leadership and ethical capacities of those serving in the professions. CTP brings together professionals from a range of disciplines to take on significant social challenges and fosters within Vanderbilt's students and its broader constituents a deep sense of vocation, encouraging professionals to remember the deeper purposes that motivate their work. [vanderbilt.edu/ctp](http://vanderbilt.edu/ctp)

**The Center for Biomedical Ethics and Society** provides leadership in education, research, and clinical service at Vanderbilt University Medical Center concerning the ethical, legal, and social dimensions of medicine, health care, and health policy. [medicineandpublichealth.vanderbilt.edu](http://medicineandpublichealth.vanderbilt.edu)

**The Center for Integrative and Cognitive Neuroscience** investigates the relationship between brain function, behavior, and cognition, and promotes the development of new technologies like advanced prosthetics and autonomous robots. [cicn.vanderbilt.edu](http://cicn.vanderbilt.edu)

**The Center for Latin American Studies** works to advance knowledge about and understanding of the region's history, culture, political economy, and social organization. [vanderbilt.edu/clas](http://vanderbilt.edu/clas)

**The Center for Medicine, Health, and Society** integrates studies of the humanities, social sciences, and academic medicine in order to examine the role of health and health care in contemporary society. [vanderbilt.edu/mhs](http://vanderbilt.edu/mhs)

**The Innovation Center** will support immersive experiences for students and interdisciplinary projects for faculty—from all schools and colleges—who are interested in innovation and entrepreneurship. In addition to connecting various resources across the university, the center will serve as a common space for students to develop and test ideas alongside their peers with mentorship from faculty, alumni, corporate partners, the Nashville entrepreneurial community, and beyond. Programming, seminars, and workshops will help students from all disciplines grow their ventures at any stage of development. [vanderbilt.edu/provost/initiatives/innovationcenter.php](http://vanderbilt.edu/provost/initiatives/innovationcenter.php)

**The MacArthur Foundation Research Network on Law and Neuroscience** addresses a focused set of closely related problems at the intersection of neuroscience and criminal justice, including mental states, capacity, and evidence. [lawneuro.org](http://lawneuro.org)

**The Max Kade Center for European and German Studies** fosters an international perspective on issues relating to Europe and transatlantic relations and seeks to prepare students for international careers or advanced study. [as.vanderbilt.edu/europeanstudies](http://as.vanderbilt.edu/europeanstudies)

**The National Center on School Choice** conducts scientific, comprehensive, and timely studies on school choice to inform policy and practice. [vanderbilt.edu/schoolchoice](http://vanderbilt.edu/schoolchoice)

**The Owen Entrepreneurship Center** brings together investors, entrepreneurs, and Vanderbilt business students to share innovative ideas. The OEC has spawned an active angel investor network and allows Owen students to have easy access to a ready-made network of successful entrepreneurs. [www2.owen.vanderbilt.edu/oec](http://www2.owen.vanderbilt.edu/oec)

**The Robert Penn Warren Center for the Humanities** promotes interdisciplinary research and study in the humanities, social sciences, and natural sciences. Members of the Vanderbilt community representing a wide variety of specializations take part in the center's programs, which are designed to intensify and increase interdisciplinary discussion of academic, social, and cultural issues. [vanderbilt.edu/rpw\\_center](http://vanderbilt.edu/rpw_center)

**The Vanderbilt Bill Wilkerson Center for Otolaryngology and Communication Sciences** is an integrated educational, research, and patient care center dedicated to serving individuals with otolaryngologic and communicative disorders. The center encourages interdisciplinary collaboration in all of the speech, language, and hearing sciences and otolaryngology specialties. [vanderbilthealth.com/billwilkerson](http://vanderbilthealth.com/billwilkerson)

**The Vanderbilt Brain Institute** promotes and facilitates the discovery efforts of Vanderbilt neuroscientists, the training of undergraduate and graduate students, and the coordination of public outreach in brain sciences. Research endeavors in the VBI include more than three hundred scientists from fifty departments, centers, and institutes across the campus, spanning a spectrum of study from molecules to the mind. [braininstitute.vanderbilt.edu](http://braininstitute.vanderbilt.edu)

**The Vanderbilt Initiative in Surgery and Engineering** creates, develops, implements, and evaluates solutions to complex interventional problems. Physicians, engineers, and computer scientists work together to improve patient care. [vanderbilt.edu/vis](http://vanderbilt.edu/vis)

**The Vanderbilt Institute for Energy and Environment** considers social, economic, legal, and technical aspects of environmental and energy prob-



lems to find solutions that are practical, achievable, and cost-effective. A crucial part of its mission is to train the next generation of leaders in the energy and environmental arena. [vanderbilt.edu/viee](http://vanderbilt.edu/viee)

**The Vanderbilt Institute for Global Health** is committed to advancing health and development in resource-limited regions with projects in Africa, Asia, Latin America, and the Caribbean. Vanderbilt faculty and staff provide leadership and expertise in establishing sustainable, scalable health development programs. [globalhealth.vanderbilt.edu](http://globalhealth.vanderbilt.edu)

**The Vanderbilt Institute for Integrative Biosystems Research and Education** fosters and enhances interdisciplinary research in the biophysical sciences and bioengineering at Vanderbilt, integrated with a strong focus on undergraduate, graduate, and postdoctoral education. VIIBRE's mission is to invent the tools and develop the skills that are required to understand biological systems across spatiotemporal scales. [vanderbilt.edu/viibre](http://vanderbilt.edu/viibre)

**The Vanderbilt Institute of Chemical Biology** provides research and training in the application of chemical approaches to the solution of important biomedical problems. Particular strengths of the institute include analytical methodology and molecular imaging, cellular responses to chemical stress, drug discovery, enzyme and receptor chemistry, proteomics, structural biology, and chemical synthesis. [vanderbilt.edu/vicb](http://vanderbilt.edu/vicb)

**The Vanderbilt Institute of Nanoscale Science and Engineering** engages in theoretical and experimental research in science and engineering at the nanoscale (from one millionth to one billionth of a meter in size). VINSE supports an extensive infrastructure of materials fabrication and analytical facilities for research in nanoscale science and engineering. [vanderbilt.edu/vinse](http://vanderbilt.edu/vinse)

**The Vanderbilt Kennedy Center for Research on Human Development** is one of fourteen Eunice Kennedy Shriver Intellectual and Developmental Disabilities Research Centers supported in part by the Eunice Kennedy Shriver National Institute of Child Health and Human Development. It also is a University Center for Excellence in Developmental Disabilities Education, Research, and Service in the national network of sixty-seven such centers in every U.S. state and territory supported by the U.S. Administration on Intellectual and Developmental Disabilities. The Vanderbilt Kennedy Center facilitates discoveries and best practices that make positive differences in the lives of persons with disabilities and their families. [vkc.mc.vanderbilt.edu](http://vkc.mc.vanderbilt.edu)

**The Vanderbilt University Institute of Imaging Science** aims to support and integrate advances in physics, engineering, chemistry, computing, and other basic sciences for the development and application of new and enhanced imaging techniques to address problems and stimulate new research directions in biology and medicine, in health and disease. [vuiis.vanderbilt.edu](http://vuiis.vanderbilt.edu)

## University Courses

By tackling pressing real-world problems and addressing big questions, University Courses educate the whole student and promote lifelong learning. The courses leverage the natural synergies across Vanderbilt's ten schools and colleges, giving students the opportunity to reach beyond their area of study and interact with faculty at the intersection of disciplines. Each course promotes transinstitutional learning while providing opportunities to embrace diverse perspectives. For more information, visit [vu.edu/university-courses](http://vu.edu/university-courses).

# Life at Vanderbilt

## The Ingram Commons and the First-Year Experience

All undergraduates spend their first year at Vanderbilt living on The Martha Rivers Ingram Commons. As part of Vanderbilt's residential college system, The Ingram Commons brings together first-year students, residential faculty, and professional staff in the common pursuit of discovery, creative inquiry, and engaged citizenship. With a focus on bolstering intellect, building community, developing skills for personal well-being, pursuing self-discovery, and celebrating cultural differences, all members of The Ingram Commons participate in a mutual exchange of ideas and experiences. The Ingram Commons achieves that goal during the year through its ten houses, the faculty heads of house appointed to mentor students in each of them, and a first-year experience of programs, academic seminars, dinners, discussions, cultural events, social activities, lectures, and guests.

The first-year experience begins with CommonVU, a required orientation week for all first-year students. It extends from Move-In Saturday through a first week of orientation and academic classes. During CommonVU, students begin to experience the new communities of their university—in their houses, across The Ingram Commons and the university campus, and in their classrooms. Activities with each other, peer mentors and other VU upperclass students, faculty heads of house, educational staff, academic advisers, and other Vanderbilt professors introduce life at Vanderbilt.

The first-year experience also includes Vanderbilt Visions, a required first-semester university core program of mentored discussion concerning the expectations, norms, and values required for a successful transition to undergraduate life. Faculty and student VUceptors partner to lead each Vanderbilt Visions small group, whose members come from all ten Ingram Commons houses and each of the four undergraduate schools and colleges. Groups meet weekly during the fall semester. All first-year students will receive assignments to a Vanderbilt Visions group on their class schedules. More information can be found at [commons.vanderbilt.edu](http://commons.vanderbilt.edu).

## Transfer Student Transition Programs

Transfer Student Orientation is Vanderbilt's mandatory orientation program for all transfer students. During this time, new transfer students will learn more about life at Vanderbilt through programs and activities with university staff members, faculty, and upperclass students known as Transfer Student Orientation Leaders. Transfer students will receive orientation information in the mail during the summer before arriving at Vanderbilt. Further details can be found at [vanderbilt.edu/transfer](http://vanderbilt.edu/transfer).

## The Vanderbilt Honor Code and the Honor System

Vanderbilt University takes pride in its honor code and its student-run honor system.

The honor code is shared by all ten schools of the university:

*Vanderbilt University students pursue all academic endeavors with integrity. They conduct themselves honorably, professionally, and respectfully in all realms of their studies in order to promote and secure an atmosphere of dignity and trust. The keystone of our honor system is self-regulation,*

*which requires cooperation and support from each member of the University community.*

The Honor System is a time-honored tradition that began with the first classes at Vanderbilt in 1875. Students established the system and continue to manage it today. It rests on the presumption that all work submitted as part of course requirements is produced by the student, without help from any other source unless acknowledgement is given in a manner prescribed by the instructor. Cheating, plagiarizing, or otherwise falsifying results of study are specifically prohibited. The system applies not only to examinations but also to written work and computer programs submitted to instructors. Detailed descriptions of Honor System violations and Undergraduate Honor Council procedures are published in the *Student Handbook*, available on the web at [vanderbilt.edu/student\\_handbook](http://vanderbilt.edu/student_handbook).

Responsibility for the preservation of the system falls on the individual student who, by registration, acknowledges the authority of the Undergraduate Honor Council. Students are expected to demand of themselves and their fellow students complete respect for the Honor Code. Ignorance of the regulations is not a defense for abuse of regulations. All incoming students attend a mandatory signing ceremony and educational program on the Honor System at the beginning of the fall semester. Additional information about the Honor System is available on the web at [studentorgs.vanderbilt.edu/HonorCouncil](http://studentorgs.vanderbilt.edu/HonorCouncil).

## Student Accountability

All students who take courses, live in residence halls, or otherwise participate in the activities of the university are within the jurisdiction of the university's student accountability system, whether or not they are registered primarily at Vanderbilt. Policies governing student conduct are published in the *Student Handbook*, on the web at [vanderbilt.edu/studentaccountability](http://vanderbilt.edu/studentaccountability), or by other reasonable means of notification. The Office of Student Accountability, Community Standards, and Academic Integrity has original jurisdiction over all matters of nonacademic misconduct involving students.

## Official University Communications

Certain federal statutes require that information be delivered to each student. Vanderbilt delivers much of this information via email. Official electronic notifications, including those required by statutes, those required by university policy, and instructions from university officials, will be sent to students' Vanderbilt email addresses: *user.name@vanderbilt.edu*. Students are required to be familiar with the contents of official university notifications, and to respond to instructions and other official correspondence requiring a response. Some messages will include links to the YES Communications Tool, which is a secure channel for official communication of a confidential nature. However, students should not wait to receive such a message, and should check YES frequently to remain current on official, confidential communications.

The university makes every effort to avoid inundating students with nonessential email (often called "spam"), and maintains separate lists from which students may unsubscribe for announcements of general interest.

## Residential Living

Vanderbilt University requires all unmarried undergraduate students to live in university housing on campus for their entire undergraduate career. This commitment to residential education is clearly expressed in the university's residential requirement: "All unmarried undergraduate students must live in residence halls on campus during the academic year, May session, and summer sessions. Authorization to live elsewhere is granted at the discretion of the director of housing assignments in special situations or when space is unavailable on campus" (*Student Handbook*).

Residential living at Vanderbilt began in the 1880s when six cottages were constructed in response to a demand for on-campus housing. In the fall of 2015, 6,077 students lived on campus, comprising about 93 percent of the undergraduate student body. Housing for graduate and professional students is not available on campus.

### Undergraduate Housing

Several types of housing are offered to meet the needs of a diverse student body—suites, singles, doubles, apartments, and lodges.

Some housing is segregated by gender; most housing is coresidential. In the coresidential areas, men and women may be housed in different living spaces on the same floor. Six officers from each fraternity and sorority may live in their fraternity or sorority houses.

TeleVU, the residence hall cable system, and ResNet, the residential data network, are available in each accommodation on campus. Residents with personal computers can connect to ResNet for high-speed data services. All residence halls provide wireless access to ResNet.

#### *First-Year Students*

First-year students live on The Martha Rivers Ingram Commons. The Ingram Commons comprises ten residential houses, the home of the dean of The Ingram Commons, and The Commons Center. The ten houses are Crawford, East, Gillette, Hank Ingram, Memorial, Murray, North, Stambaugh, Sutherland, and West. Each house is led by a resident faculty head of house.

East, Gillette, Memorial, North, and West houses are historical buildings renovated for The Ingram Commons. Crawford, Hank Ingram, Murray, Stambaugh, and Sutherland were constructed between 2006 and 2008. All houses are air conditioned and fully sprinklered for fire safety. Access to all residence halls is controlled with a card access system. Students on The Ingram Commons live in traditional double or triple rooms. All student rooms have basic room furnishings that include loftable bed, chest, desk, chair, closet, and window blinds. Lounges, study rooms, seminar rooms, music practice rooms, and laundry facilities are located within The Ingram Commons.

#### *Upperclass Students*

Upperclass students live in nineteen residence halls in six residential areas on the central campus: Warren and Moore colleges, Alumni Lawn, Carmichael Towers East and West, Branscomb Quadrangle, and Highland Quadrangle. All residence halls are air conditioned and are fully equipped with sprinklers for fire safety. Access to all residence halls is controlled with a card access system.

Warren and Moore colleges are the first two residential colleges for upperclass students in Vanderbilt's College Halls system. Together, the two colleges house 660 students comprising equal numbers of women and men. Two hundred and twenty spaces are designated for each class cohort—seniors, juniors, and sophomores. A faculty director lives in each college and each is assisted by two graduate fellows who live in residence. Each college offers a mix of living accommodations: suites for six, five, and four students; traditional double rooms; and traditional single rooms.

Alumni Lawn comprises McGill Hall, Cole and Tolman halls, and McTyeire International House. McGill Hall houses approximately one hundred students in primarily single rooms with common bath facilities on each floor. Housing slightly more than one hundred students each in single rooms, Cole and Tolman halls house female and male populations, respectively. McTyeire International House houses approximately one hundred students in single rooms with common bath facilities on each floor.

Upperclass students are also housed in the fourteen-story Carmichael Towers complex located on West End Avenue. Carmichael has two styles of living arrangements: (a) single and double rooms arranged in six-person suites with bath, kitchen, and common area and (b) single and double rooms arranged on halls, with common bath facilities on each floor. The Towers are complete with lounges, meeting rooms, laundry facilities, recreation areas, music practice rooms, a convenience store, and a Food Court.

Branscomb Quadrangle (Lupton, Scales, Stapleton, and Vaughn) offers two physical arrangements: (a) double rooms with a common bath on each floor and (b) suites of two double rooms connected by a half bath (with a common bath on each floor). The complex contains laundry facilities, lounges, study rooms, music practice rooms, and a quick-service restaurant and convenience store.

At the south end of the campus is Highland Quadrangle comprising Chaffin Place, Lewis House, Morgan House, and Mayfield Place. Chaffin contains two-bedroom apartments that house four students. Students share efficiencies and one- and two-bedroom apartments in Morgan and Lewis houses. In Mayfield, units of ten single rooms cluster around a two-story living room area. A laundry facility and a convenience store are located in this residential area.

#### *Living Learning Communities*

McGill Hall is the home of the McGill Project, designed to stimulate and foster discussion and exploration of philosophical issues between students and faculty. Faculty members meet with residents in McGill for informal discussion (open to all students) and formal class work. Residents also plan and participate in social events hosted by the student-run McGill Council.

The goals of the McTyeire International House language programs are to improve the fluency of McTyeire Hall residents in Chinese, French, German, Japanese, Russian, or Spanish languages, and to expand communication between international and American students by means of discussions, programs, and international coffees and festivals. An international interest hall is offered in English for students with interest in global citizenship. Space is available for ninety-six upperclass students in single rooms. Living in McTyeire carries a commitment to take a predetermined number of weekly meals in the McTyeire dining room.

Mayfield Place is the site for the Mayfield Living Learning Lodge program. Lodges are set aside for groups of ten students who want to establish their own special-interest lodges. Such programs have included arts, community service, computers, environment/recycling, world religions, music, and wellness. Each lodge selects a faculty adviser who provides guidance throughout the year.

### Residential Education Administration

The residential community at Vanderbilt is divided into seven geographic areas, each of which has a full-time professional living within the area. Upperclass and graduate or professional students serve as head residents and resident advisers in the residence halls. The dean of students, eight area coordinators, and six graduate area coordinators also live on campus. For more information, go to [vanderbilt.edu/ResEd](http://vanderbilt.edu/ResEd).

Residence halls for first-year students have RAs on each floor. Area coordinators and their student staff are responsible for maintaining an atmosphere conducive to the students' general welfare and education.

Vanderbilt Student Government (VSG) plans programs and recreational and social activities, and advises the residential affairs administration on policy matters.

### Room Assignment

**First-Year Students.** First-year students may apply for housing after payment of their matriculation fees. Students will be assigned to double or triple rooms. Roommate or hallmate requests are considered. Admission to the university does not guarantee assignment to a particular building, kind of room, or a particular roommate or hallmate.

**Returning Upperclass Students.** Returning unmarried upperclass students receive their housing assignments through a random selection process in the spring. A local hall selection is held for students who want to remain in the same room or to change rooms within the same residence hall. Eligibility for participation is determined by the director of housing assignments with advice from VSG. A specific number of current residents of a suite, apartment, or lodge must return in order to reserve that living space.

**Transfer and Former Students.** Requests for room assignments by new transfer students and former students returning to campus are made through the Office of Housing and Residential Education, and are determined by the date of deposit. The university tries to accommodate as many transfer students as possible, but acceptance at Vanderbilt does not guarantee campus housing.

### The Commodore Card

The Commodore Card is the Vanderbilt student ID card. It can be used to access debit spending accounts, VU meal plans, and campus buildings such as residence halls, libraries, academic buildings, and the Vanderbilt Recreation and Wellness Center.

ID cards are issued at the Commodore Card Office, 184 Sarratt Student Center, Monday through Friday from 8:30 a.m. to 4:00 p.m. For more information, go to [vanderbilt.edu/cardservices](http://vanderbilt.edu/cardservices).

### Eating on Campus

Vanderbilt Campus Dining's meal plan program, VU Meal Plans, gives students comprehensive dining options. Features include extended hours, multiple locations, variety, special

events, Meal Money, Taste of Nashville (ToN) program, and Flex Meals.

Vanderbilt students living on campus are required to participate in VU Meal Plans. All first-year students are on the First-Year Meal Plan. Other students may purchase the 8, 14, or 19 Meal Plan.

There are a variety of options conveniently located across campus. The Ingram Commons dining hall, Rand Dining Center, Pub at Overcup Oak, Grins Vegetarian Café, Chef James Bistro, Last Drop Coffee Shop, the Kitchen at Kissam, Rocket Subs, RoTiki, Bamboo Bistro, Pi and Leaf, Engineering Café, and Blair Café all host the VU Meal Plans. Vanderbilt Campus Dining also operates six convenience stores including Kissam Market, Branscomb Market, and Common Grounds at The Commons Center, which are open 24 hours and accept VU Meal Plans.

For more information on VU Meal Plans, go to [campusdining.vanderbilt.edu/vu-meal-plans](http://campusdining.vanderbilt.edu/vu-meal-plans). For more information on Vanderbilt Campus Dining, go to [campusdining.vanderbilt.edu](http://campusdining.vanderbilt.edu).

### Barnes & Noble at Vanderbilt

Barnes & Noble at Vanderbilt, the campus bookstore located at 2525 West End Avenue, offers textbooks (new, used, digital, and rental), computers, supplies, Nook e-readers, dorm accessories, licensed Vanderbilt apparel, and best-selling books. Students can order online or in-store and receive course materials accurately, conveniently, and on time. The bookstore features extended hours of operation and hosts regular special events. Visitors to the bookstore café can enjoy Starbucks coffees, sandwiches, and desserts while studying. Free customer parking is available in the 2525 garage directly behind the bookstore. For more information, visit [vubookstore.com](http://vubookstore.com), follow [twitter.com/BN\\_Vanderbilt](https://twitter.com/BN_Vanderbilt), find the bookstore on Facebook at [facebook.com/VanderbiltBooks](https://facebook.com/VanderbiltBooks), or call (615) 343-2665.

## Services to Students

### Student Records (Family Educational Rights and Privacy Act)

Vanderbilt University is subject to the provisions of federal law known as the Family Educational Rights and Privacy Act (also referred to as FERPA). This act affords matriculated students certain rights with respect to their educational records. These rights include:

1. The right to inspect and review their education records within 45 days of the day the University receives a request for access. Students should submit to the University Registrar written requests that identify the record(s) they wish to inspect. The University Registrar will make arrangements for access and notify the student of the time and place where the records may be inspected. If the University Registrar does not maintain the records, the student will be directed to the University official to whom the request should be addressed.
2. The right to request the amendment of any part of their education records that a student believes is inaccurate or misleading. Students who wish to request an amendment to their educational record should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the University decides not to amend the record as requested by the student, the student will be notified of the decision and advised of his or her right to a hearing.

3. The right to consent to disclosures of personally identifiable information contained in the student's education records to third parties, except in situations that FERPA allows disclosure without the student's consent. These exceptions include:

- Disclosure to school officials with legitimate educational interests. A "school official" is a person employed by the University in an administrative, supervisory, academic or research, or support-staff position (including University law enforcement personnel and health staff); contractors, consultants, and other outside service providers with whom the University has contracted; a member of the Board of Trust; or a student serving on an official University committee, such as the Honor Council, Student Conduct Council, or a grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.
- Disclosure to parents if the student is a dependent for tax purposes.
- Disclosure to appropriate individuals (e.g., parents/guardians, spouses, housing staff, health care personnel, police, etc.) where disclosure is in connection with a health or safety emergency and knowledge of such information is necessary to protect the health or safety of the student or other individuals.
- Disclosure to a parent or legal guardian of a student, information regarding the student's violation of any federal, state, or local law, or of any rule or policy of the institution, governing the use or possession of alcohol or a controlled substance if the University has determined that the student has committed a disciplinary violation with respect to the use or possession and the student is under the age of 21 at the time of the disclosure to the parent/guardian.

FERPA provides the University the ability to designate certain student information as "directory information." Directory information may be made available to any person without the student's consent unless the student gives notice as provided for, below. Vanderbilt has designated the following as directory information: the student's name, address, telephone number, email address, student ID photos, major field of study, school, classification, participation in officially recognized activities and sports, weights and heights of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended by the student, and other information that would not generally be considered harmful or an invasion of privacy if disclosed. Any student who does not wish disclosure of directory information should notify the University Registrar in writing. No element of directory information as defined above is released for students who request nondisclosure except as required by statute.

The request for nondisclosure does not apply to class rosters in online class management applications, or to residential rosters—or rosters of groups a student may join voluntarily—in online, co-curricular engagement applications, or rosters of other information on the websites of student organizations that a student may join. Neither class rosters in online class management applications, nor residential rosters in online co-curricular engagement applications, are available to the public.

As of January 3, 2012, the U.S. Department of Education's FERPA regulations expand the circumstances under which students' education records and personally identifiable information (PII) contained in such records—including Social Security Numbers, grades, or other private information—may be accessed without consent. First, the U.S. Comptroller General, the U.S. Attorney General, the U.S. Secretary of Education, or state and local education authorities ("Federal and State Authorities") may allow access to student records and PII without consent to any third party designated by a Federal or

State Authority to evaluate a federal- or state-supported education program. The evaluation may relate to any program that is "principally engaged in the provision of education," such as early childhood education and job training, as well as any program that is administered by an education agency or institution.

Second, Federal and State Authorities may allow access to education records and PII without consent, to researchers performing certain types of studies, in certain cases even when the University objects to or does not request such research. Federal and State Authorities must obtain certain use-restriction and data security promises from the third parties that they authorize to receive PII, but the Authorities need not maintain direct control over the third parties.

In addition, in connection with Statewide Longitudinal Data Systems, State Authorities may collect, compile, permanently retain, and share without student consent, PII from education records, and may track student participation in education and other programs by linking such PII to other personal information that they obtain from other Federal or State data sources, including workforce development, unemployment insurance, child welfare, juvenile justice, military service, and migrant student records systems.

If a student believes the University has failed to comply with FERPA, he or she may file a complaint using the Student Complaint and Grievance Procedures as outlined in the *Student Handbook*. If dissatisfied with the outcome of this procedure, students may file a written complaint with the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington, DC 20202-5920.

Questions about the application of the provisions of the Family Educational Rights and Privacy Act should be directed to the University Registrar or to the Office of General Counsel.

### *Vanderbilt Directory*

Individual listings in the online People Finder Directory consist of the student's full name, Vanderbilt email address, and campus mailing address (if available). Students may elect to add additional contact information to their listings, including school, academic classification, local phone number, local address, permanent address, cellphone, pager, and fax numbers. Student listings in the People Finder Directory are available to the Vanderbilt community via logon ID and e-password. Students may choose to make their online People Finder listings available to the general public (i.e., viewable by anyone with access to the internet), or to block individual directory items. Students who have placed a directory hold with the University Registrar will not be listed in the online directory.

Directory information should be kept current. Students may report address changes, emergency contact information, and missing person contact information via the web by logging in to YES (Your Enrollment Services) <https://yes.vanderbilt.edu> and clicking on the Address Change link.

### **Counseling and Advisory Services**

Advising is an important part of Vanderbilt's central mission to help each student achieve individual goals. Many support services are provided, including pre-major and major academic advising and career and personal counseling. Residence hall staff are continuously on call.

Deans and professional staff in academic programs, in all areas of the Office of the Dean of Students, and in other areas of the university offer counseling and advising services to students:

Career Center  
 Center for Student Wellbeing  
 Equal Opportunity, Affirmative Action, and Disability Services  
 Faculty Advisers  
 Health Professions Advisers  
 International Student and Scholar Services  
 Margaret Cuninggim Women's Center  
 Office of Housing and Residential Education  
 Office of LGBTQI Life  
 Office of Student Activities  
 Office of Student Leadership Development  
 Office of the University Chaplain and Religious Life  
 Pre-Business Advisers  
 Pre-Law Advisers  
 Psychological and Counseling Center  
 STEM Help Desks in The Ingram Commons  
 STEM Help Desks in Featheringill  
 Student Health Center  
 Teacher Education Adviser, Arts and Science  
 Teacher Licensure Office, Peabody College  
 Tutoring Services  
 Writing Studio

### Career Center

The Career Center prepares students for internships and jobs by helping them explore career paths, develop professional capabilities, define their identities, and build resilience to be competitive in a rapidly changing world.

Center staff coach students by industry cluster versus academic major, which allows students to explore a variety of areas, meet industry-specific employers, and understand the qualifications and application processes for a variety of companies and industries. Customized events and activities for each cluster may include mentoring programs, city-specific networking events, career fairs, and virtual career conversations featuring alumni from around the world.

Students from any class can benefit from center services. First-year students have access to trained peer coaches in the satellite office in The Ingram Commons and a variety of programs and activities led by center staff in the houses. For more information about the Career Center, visit [vanderbilt.edu/career](http://vanderbilt.edu/career).

### Services for Students with Disabilities

Vanderbilt is committed to the provisions of the Rehabilitation Act of 1973 and Americans with Disabilities Act as it strives to be an inclusive community for students with disabilities. Students seeking accommodations for any type of disability are encouraged to contact the Equal Opportunity, Affirmative Action, and Disability Services Department. Services include, but are not limited to, extended time for testing, assistance with locating sign language interpreters, audiotaped textbooks, physical adaptations, notetakers, and reading services. Accommodations are tailored to meet the needs of each student with a documented disability. Specific concerns pertaining to services for people with disabilities or any disability issue should be directed to the Disability Program Director, Equal Opportunity, Affirmative Action, and Disability Services Department (EAD), PMB 401809, 2301 Vanderbilt Place, Nashville, Tennessee 37240-1809; phone (615) 322-4705 (V/TDD); fax (615) 343-0671; [vanderbilt.edu/ead](http://vanderbilt.edu/ead).

### Nondiscrimination, Anti-Harassment, and Anti-Retaliation

The Equal Opportunity, Affirmative Action, and Disability Services Department investigates allegations of prohibited discrimination, harassment, and retaliation involving members of the Vanderbilt community. This includes allegations of sexual misconduct and other forms of power-based personal violence. Vanderbilt's Title IX coordinator is Anita Jenious, EAD director.

If you believe that a member of the Vanderbilt community has engaged in prohibited discrimination, harassment, or retaliation, please contact the EAD. If the offense is criminal in nature, you may file a report with Vanderbilt University Police Department (VUPD).

The EAD also facilitates interim accommodations for students impacted by sexual misconduct and power-based personal violence. Some examples of interim accommodations include stay-away orders, adjusted course schedules, and housing changes.

Specific concerns pertaining to prohibited discrimination, harassment, or retaliation, including allegations of sexual misconduct and other forms of power-based personal violence, should be directed to the Equal Opportunity, Affirmative Action, and Disability Services Department (EAD), PMB 401809, 2301 Vanderbilt Place, Nashville, Tennessee 37240-1809; phone (615) 322-4705 (V/TDD); fax (615) 343-0671; [vanderbilt.edu/ead](http://vanderbilt.edu/ead).

### Psychological and Counseling Center

As part of the Vanderbilt University Medical Center, the PCC supports the mental health needs of all students to help them reach their academic and personal goals. Highly skilled and multidisciplinary staff collaborates with students to provide evidence-based treatment plans tailored to each individual's unique background and needs. The PCC also emphasizes prevention through collaboration with campus partners, providing outreach and consultation focused on the development of the skills and self-awareness needed to excel in a challenging educational environment.

The PCC's psychologists, licensed counselors, and psychiatric medical providers are available to any Vanderbilt student and address a range of student needs including stress management, crisis intervention, substance abuse counseling, management of medications, individual counseling, group counseling, biofeedback, emergency assessments, and psychiatric assessment and treatment. The PCC provides a team approach to the care of students with eating disorders and students who have experienced trauma as well as students needing both counseling and medication management. There is an on-call provider after hours and on weekends for emergency calls.

The PCC provides screening and full assessment when indicated for ADHD and learning disorders.

The PCC has a team that specializes in treatment of substance misuse and collaborates with the Center for Student Wellbeing to incorporate prevention and treatment resources.

The PCC also houses a Mind Body Lab. This room is designed with the objective of enhancing mindfulness by providing tools to manage stress, increase personal resilience, and promote compassion and academic success. Students may book a forty-five-minute session in the PCC Mind Body Lab by calling the PCC at (615) 322-2571 or by stopping by the front desk.

Students and their parents are encouraged to make contact with the PCC prior to the start of the school year if the student has a history of mental health care needs. This will help

facilitate the transition of care and ensure that students and parents are fully aware of PCC resources. Contact the center at (615) 322-2571 for more information.

There is no charge for services with the exceptions of reduced fees for LD/ADHD screening and assessment and specific disability assessments when needed for academic or environmental accommodations. Over the course of a year, approximately 20 percent of the Vanderbilt student population will seek out the services of the PCC.

Throughout the year, the PCC team members also produce presentations, including educational programs, thematic presentations, and special events, focused on education of the Vanderbilt community about mental health issues and resources. The PCC is proud to provide a program focusing on suicide prevention and mental health awareness at Vanderbilt called MAPS: Mental Health Awareness and the Prevention of Suicide.

For more information, visit [medschool.vanderbilt.edu/pcc](http://medschool.vanderbilt.edu/pcc).

### Project Safe Center

The Project Safe Center partners with students, faculty, and staff to create a campus culture that rejects sexual violence and serves as a resource for all members of the Vanderbilt community. Operating under the auspices of the Office of the Dean of Students, the Project Safe Center provides support to survivors of sexual violence and engages the campus community in bystander intervention efforts and sexual assault prevention.

Green Dot, a bystander intervention program used by colleges and communities nationwide, an online education module addressing power-based violence, and a variety of programs and presentations on consent, healthy relationships, and violence prevention are available through the Project Safe Center. A 24-hour support hotline answered by Project Safe's victim resource specialists is available at (615) 322-SAFE (7233).

The Project Safe Center located at 304 West Side Row is open Monday through Friday, 8:00 a.m. to 5:00 p.m. For more information, please call (615) 875-0660 or visit [vanderbilt.edu/projectsafe](http://vanderbilt.edu/projectsafe).

### Student Health Center

The Student Health Center provides primary care services for students and is staffed by physicians, nurse practitioners, nurses, and a lab technician. The Student Health Center provides services similar to those provided in a private physician's office or HMO, including routine medical care, specialty care (e.g. nutrition and sports medicine), and some routine lab tests. Most of the services students receive at the Student Health Center are pre-paid, but those services that are not are the responsibility of students to coordinate with their health insurance.

When the university is in session, during fall and spring semesters, the Student Health Center is open Monday through Friday from 8:00 a.m. to 4:30 p.m., and Saturdays from 8:30 a.m. to noon. Students should call ahead to schedule an appointment at (615) 322-2427. Students with urgent problems will be seen on a same-day basis. They will be given an appointment that day, or "worked in" on a first-come, first-served basis if no appointments are available.

Emergency consultations services (at (615) 322-2427) are available 24 hours a day, 7 days a week from on-call professionals. For more detailed information on the services available at the Student Health Center and information on other health-related topics, please visit the Student Health Center website at [medschool.vanderbilt.edu/student-health](http://medschool.vanderbilt.edu/student-health).

### Immunization Requirements

The State of Tennessee requires certain immunizations for all students on university campuses. As such, Vanderbilt University will block student registration for those who are not in compliance with the requirements.

The requirements include:

1. *Meningococcal meningitis vaccine (one injection)* within four years of enrollment for all incoming students living in on-campus housing.
2. *Varicella vaccine (two injections)* is required for all students who have not had documented chickenpox history.
3. *Measles, mumps, and rubella (2 injections)* for all incoming students.

The Student Health Center requires all incoming students to complete a Health Questionnaire that includes further information regarding the state-mandated vaccinations, as well as information on other strongly recommended vaccinations.

Information regarding this Health Questionnaire is communicated to students by email after admission to Vanderbilt University. This Health Questionnaire must be returned to the Student Health Center by May 15 with vaccination information.

Students should go to [medschool.vanderbilt.edu/student-health/immunization-requirements](http://medschool.vanderbilt.edu/student-health/immunization-requirements) in order to access more information regarding the immunization requirements. This site also contains links to the PDFs of the required forms.

All vaccines can be administered at either a private provider office, retail pharmacy clinic, or the Student Health Center.

### Student Injury and Sickness Insurance Plan

All degree-seeking students, with the exception of Division of Unclassified Studies (DUS) students, who are registered for 4 or more credit hours, are required to have health insurance coverage. The university offers a sickness and injury insurance plan that is designed to provide hospital, surgical, and major medical benefits. A brochure explaining the benefits of insurance coverage is available to students online at [gallagherstudent.com/vanderbilt](http://gallagherstudent.com/vanderbilt) or [medschool.vanderbilt.edu/student-health/student-health-insurance](http://medschool.vanderbilt.edu/student-health/student-health-insurance).

The annual premium is in addition to tuition and is automatically billed to the student's account. Coverage extends from August 12 until August 11 of the following year, whether a student remains in school or is away from the university.

A student who does not want to subscribe to the insurance plan offered through the university must complete an online waiver form indicating other insurance coverage at [gallagherstudent.com/vanderbilt](http://gallagherstudent.com/vanderbilt). This process must be completed by August 1 for students enrolling in the fall. Newly enrolled students for the spring term must complete the online waiver process by January 3. The online waiver process must be completed by August 1 every year in order to waive participation in and the premium for the Student Injury and Sickness Plan.

**Family Coverage:** Students who want to obtain coverage for their families (spouse, children) may do so at [gallagherstudent.com/vanderbilt](http://gallagherstudent.com/vanderbilt). Additional premiums are charged for family health insurance coverage and cannot be put on a student's VU account.

### International Student Coverage

International students and their dependents residing in the United States are required to purchase the university's

international student injury and sickness insurance. If you have other comparable insurance and do not wish to participate in the Student Injury and Sickness Insurance Plan offered through the university, you must complete an online waiver process ([gallagherstudent.com/vanderbilt](http://gallagherstudent.com/vanderbilt)) indicating your other insurance information. This online waiver process must be completed no later than September 7 or you will remain enrolled in the plan offered by the university and will be responsible for paying the insurance premium. This insurance is required for part-time as well as full-time students.

### **Vanderbilt Child and Family Center**

The Vanderbilt Child and Family Center supports the health and productivity of the Vanderbilt community by providing resource and referral services and quality early childhood education and care to the children of faculty, staff, and students. The center's website at [vanderbilt.edu/child-family-center](http://vanderbilt.edu/child-family-center) provides information concerning child care, elder care, summer camps, tutoring services, and school-age child care. *Care.com* and the Vanderbilt Sitter Service provide back-up care options for dependents of all ages and evening, night, and weekend care.

The Child Care Center serves children ages six weeks through five years. Applications for the waiting list may be downloaded from the website. The Family Center offers a monthly lunchtime series, Boomers, Elders, and More, and a caregiver support group.

### **Bishop Joseph Johnson Black Cultural Center**

The Bishop Joseph Johnson Black Cultural Center (BJJBCC) represents one of Vanderbilt University's numerous efforts at acknowledging and promoting diversity. It does so by providing educational and cultural programming on the black experience for the entire Vanderbilt community. Dedicated in 1984, the center is named for the first African American student admitted to Vanderbilt University in 1953, Bishop Joseph Johnson (B.D. '54, Ph.D. '58).

One of the center's aims is to provide cultural programming. It sponsors lectures, musical performances, art exhibitions, films, and discussions on African and African American history and culture. The center also provides an office space for a scholarly journal, the *Afro-Hispanic Review*, edited by Vanderbilt faculty and graduate students.

Another of the center's aims is student support and development. The center provides meeting spaces for numerous Vanderbilt student groups, including the Black Student Alliance, Every Nation Campus Ministries, and Vanderbilt Spoken Word. The center works with students on a wide range of campus projects and community service opportunities. The center also serves as a haven for students, with opportunities for informal fellowship with other students of all levels as well as with faculty and staff.

One additional aim of the center is community outreach and service. To this end, the center reaches out to civic and cultural groups. The BJJBCC facilitates tutoring and mentoring activities for young people from the Metro Nashville Public Schools, the YMCA, and other community agencies. VU students serve as tutors and mentors to young people in the Edgehill community. The center also helps promote student recruitment by hosting various pre-college groups.

The center houses a computer lab, a small library, a seminar room, an auditorium, a student lounge area, and staff offices. The center is open to all Vanderbilt students, faculty, and staff for programs and gatherings.

### **International Student and Scholar Services**

International Student and Scholar Services (ISSS) fosters the education and development of nonimmigrant students and scholars to enable them to achieve their academic and professional goals and objectives. ISSS provides advice, counseling, and advocacy regarding immigration, cross-cultural, and personal matters. ISSS supports an environment conducive to international education and intercultural awareness via educational, social, and cross-cultural programs.

ISSS provides immigration advising and services, including the processing of immigration paperwork, to more than 1,500 international students and scholars. The office works with admission units, schools, and departments to generate documentation needed to bring nonimmigrant students and scholars to the U.S. Further, ISSS keeps abreast of the regulations pertaining to international students and scholars in accordance with the Department of Homeland Security (Bureau of Citizenship and Immigration Services) and the Department of State. ISSS coordinates semiannual orientation programs for students and ongoing orientations for scholars, who arrive throughout the year.

To help promote connection between international students and the greater Nashville community, ISSS coordinates the First Friends program, which matches international students with Americans both on and off campus for friendship and cross-cultural exchange. The weekly World on Wednesday presentations inform, broaden perspectives, and facilitate cross-cultural understanding through discussions led by students, faculty, and staff. International Education Week in the fall provides the campus with additional opportunities to learn about world cultures and to celebrate diversity. The International Lens Film Series (iLens) brings more than forty international films to campus each year. ISSS provides a range of programs and activities throughout the year to address a variety of international student needs and interests. These programs include International Orientation Leaders and a selection of holiday parties. The Southern Culture Series is an opportunity for students to experience Southern culture in nearby cities such as Memphis, Chattanooga, and Atlanta.

### **Margaret Cuninggim Women's Center**

As part of the Office of the Dean of Students, the Margaret Cuninggim Women's Center leads co-curricular campus initiatives related to women's and gender issues. The center partners with many departments, programs, and individuals across campus to raise awareness about the ways in which gender shapes and is shaped by our lived experiences. Because its aim is to make the Vanderbilt community more inclusive and equitable, the center encourages all members of the Vanderbilt community to take part in its events and resources.

The Women's Center celebrates women and their accomplishments and fosters empowerment for people of all identities. The center offers individual support and advocacy around a variety of issues, including gender stereotyping, gender equity, leadership, parenting, body image, disordered eating, pregnancy and reproduction, sexual health, and more. The Women's Center is open Monday through Friday, 8:00 a.m. to 5:00 p.m. and is located at 316 West Side Row. For more information, please call (615) 322-4843 or visit [vanderbilt.edu/womenscenter](http://vanderbilt.edu/womenscenter).

### **Office of LGBTQI Life**

As a part of Vanderbilt's Office of the Dean of Students, the Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex



(LGBTQI) Life office is a welcoming space for individuals of all identities and a resource for information and support about gender and sexuality. LGBTQI Life serves the entire Vanderbilt community through education, research, programming, support, and social events. The office also serves as a comfortable study and socializing space, as well as a connection point to the greater Nashville LGBTQI community. In addition, LGBTQI Life conducts tailored trainings and consultations for the campus and community. The Office of LGBTQI Life is located in the K. C. Potter Center, Euclid House, 312 West Side Row. For more information, please visit [vanderbilt.edu/lgbtqi](http://vanderbilt.edu/lgbtqi).

### Schulman Center for Jewish Life

The 10,000-square-foot Ben Schulman Center for Jewish Life is the home of Vanderbilt Hillel. The goal of the center is to provide a welcoming community for Jewish students at Vanderbilt and to further religious learning, cultural awareness, and social engagement. Vanderbilt Hillel is committed to enriching lives and enhancing Jewish identity. It provides a home away from home, where Jews of all denominations come together, united by a shared purpose. The Schulman Center is also home to Grin's Cafe, Nashville's only kosher and vegetarian restaurant. For further information about the Schulman Center, please call (615) 322-8376 or email [hillel@vanderbilt.edu](mailto:hillel@vanderbilt.edu).

### Office of the University Chaplain and Religious Life

The Office of the University Chaplain and Religious Life provides opportunities to explore and practice religion, faith, and spirituality and to more deeply understand one's personal values and social responsibility via educational programming, encounters with various faith perspectives, and engagement with religious and spiritual communities. The office welcomes and serves all students, faculty, and staff and provides an intellectual home and ethical resource for anyone in the Vanderbilt community seeking to clarify, explore, and deepen understanding of their lives and/or faith.

Recognizing the importance of exploring one's faith in community, the office facilitates opportunities for individuals of a shared faith to worship/practice their particular religious tradition. Whether guided by one of our affiliated chaplains or a student-run religious organization, these groups foster a sense of community and common values. For a complete listing of campus religious groups, resources, services, and programming opportunities, visit [vanderbilt.edu/religiouslife](http://vanderbilt.edu/religiouslife).

### Parking and Vehicle Registration

Parking space on campus is limited. Motor vehicles operated on campus at any time by students, faculty, or staff must be registered with Parking Services located at 28th Avenue South in the 2800 Building. A fee is charged. Parking regulations are published annually and are strictly enforced. More information is available at [vanderbilt.edu/parking](http://vanderbilt.edu/parking).

Freshmen may not purchase a parking permit or park on campus at any time. Bicycles must be registered with the Vanderbilt University Police Department.

### Vanderbilt University Police Department

The Vanderbilt University Police Department, (615) 322-2745, is a professional law enforcement agency dedicated to the protection and security of Vanderbilt University and its diverse community ([police.vanderbilt.edu](http://police.vanderbilt.edu)).

The Vanderbilt University Police Department comes under the charge of the Office of the Vice Chancellor for Administration. As one of Tennessee's larger law enforcement agencies, the Vanderbilt University Police Department provides comprehensive law enforcement and security services to all components of Vanderbilt University including the academic campus, Vanderbilt University Medical Center, Vanderbilt Health at One Hundred Oaks, and a variety of university-owned facilities throughout the Davidson County area.

The Police Department includes a staff of more than one hundred people, organized into three divisions under the Office of the Associate Vice Chancellor and Chief of Police: Operations Division (Main Campus, Medical Center, and 100 Oaks Precincts), Administrative Division, and Auxiliary Services Division. All of Vanderbilt's commissioned police officers have completed officer training at a state-certified police academy and are required to complete on-the-job training as well as attend annual in-service training. Vanderbilt police officers hold Special Police Commissions and have the same authority as that of a municipal law enforcement officer, while on property owned by Vanderbilt, on adjacent public streets and sidewalks, and in nearby neighborhoods. When a Vanderbilt student is involved in an off-campus offense, police officers may assist with the investigation in cooperation with local, state, or federal law enforcement. The department also employs non-academy-trained officers called community service officers (commonly referred to as CSOs) who lend assistance 24/7 to the Vanderbilt community through services that include providing walking escorts, providing jump starts, and unlocking cars. For non-emergency assistance from a community service officer, dial (615) 322-2745 (2-2745 from an on-campus extension).

The Vanderbilt University Police Department provides several services and programs to members of the Vanderbilt community:

**Vandy Vans**—The Vanderbilt University Police Department administers the Vandy Vans escort system at Vanderbilt University. The Vandy Vans escort system provides vehicular escorts to designated locations on campus. The service consists of vans that operate from 5:00 p.m. to 5:00 a.m. GPS technology allows students to track Vandy Vans on their route via computer or mobile phone, and to set up text message alerts to let them know when a van will be arriving at their stop.

Stop locations were chosen based on location, the accessibility of a secure waiting area, and student input. Signs, freestanding or located on existing structures, identify each stop. A walking escort can be requested to walk a student from his/her stop to the final destination. A van is also accessible to students with mobility impairments. For complete information about the Vandy Vans service, including routes, stops, and times, please visit [vandyvans.com](http://vandyvans.com) or call (615) 322-2554.

As a supplement to the Vandy Vans van service, walking escorts are available for students walking to and from any location on campus during nighttime hours. Walking escorts are provided by VUPD officers. The telephone number to call for a walking escort is (615) 421-8888, or 1-8888 from a campus phone, after which, a representative from VUPD will be dispatched to the caller's location, or to a designated meeting point to accompany the caller to his or her destination.

**Emergency Phones**—Emergency telephones (Blue Light Phones) are located throughout the university campus, Medical Center, and 100 Oaks.

Each phone has an emergency button that when pressed automatically dials the VUPD Communications Center. An open line on any emergency phone will activate a priority

response from an officer. An officer will be sent to check on the user of the phone, even if nothing is communicated to the dispatcher. Cooperation is essential to help us maintain the integrity of the emergency phone system. These phones should be used only for actual or perceived emergency situations.

An emergency response can also be activated by dialing 911 from any campus phone. Cellphone users can dial (615) 421-1911 to summon an emergency response on campus. Cellphone users should dial 911 for off-campus emergencies. Callers should be prepared to state the location from which they are calling.

**Security Notices**—In compliance with the U.S. Department of Higher Education and the Jeanne Clery Act, Security Notices are issued to provide timely warning information concerning a potentially dangerous situation on or near Vanderbilt University. This information is provided to empower our students and employees with the information necessary to make decisions or take appropriate actions concerning their own personal safety. Security Notices are distributed throughout Vanderbilt to make community members aware of significant crimes that occur at the university. They are distributed through Vanderbilt email lists and through the department's webpage, [police.vanderbilt.edu/crime-info/crime-alerts](http://police.vanderbilt.edu/crime-info/crime-alerts).

**Educational and Assistance Programs**—The Crime Prevention Unit of Vanderbilt University Police Department offers programs addressing issues such as sexual assault, domestic violence, workplace violence, personal safety, RAD (Rape Aggression Defense) classes, and victim assistance. VUPD provides additional services including property registration (for bikes, laptops, etc.), lost and found, weapons safekeeping, and Submit a Crime Tip. For further information on available programs and services, call (615) 322-7846 or visit [police.vanderbilt.edu](http://police.vanderbilt.edu).

Additional information on security measures and crime statistics for Vanderbilt is available from the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212. Information is also available at [police.vanderbilt.edu](http://police.vanderbilt.edu).

**Annual Security Report**—The *Vanderbilt University Annual Security Report* is published each year to provide you with information on security-related services offered by the university and campus crime statistics in compliance with the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act and the Tennessee College and University Security Information Act.

This booklet is prepared with information provided by the Nashville Metropolitan Police Department, the Department of Student Athletics, Office of the Dean of Students, the Office of Housing and Residential Education, and the Vanderbilt University Police Department. It summarizes university programs, policies, and procedures designed to enhance personal safety for everyone at Vanderbilt.

A copy of this report may be obtained by writing or calling the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212 or by telephone at (615) 343-9750. This report may also be obtained on the website at [police.vanderbilt.edu/annual-security-report](http://police.vanderbilt.edu/annual-security-report).

## Extracurricular Activities

### Student Governance

Vanderbilt Student Government (VSG) works in partnership with faculty and administration to represent student interests, concerns, and aspirations. In addition, the organization sponsors and coordinates activities that promote student

involvement and interaction with faculty. Student interests are addressed through the three branches of the organization: executive, legislative, and judicial. The executive branch includes the executive board, cabinet, programming team, as well as ad hoc and standing committees. The legislative branch is made up of elected student officials representing the four undergraduate schools and the residential areas. The judicial branch enforces rules set forth in VSG-governing documents. Students are encouraged to become involved with VSG in either appointed or elected positions.

The CommonDores Leadership Council (CLC) is a newly expanded program specifically for first-year students. Accomplished in collaboration with The Martha Rivers Ingram Commons, the CLC was designed to better align VSG's residential governance structure with the university's movement toward a universal college hall program. Incoming students are able to get involved in student government as a part of their positional leadership roles within their Ingram Commons houses.

### Active Citizenship and Service

Active citizenship and service are vital components of the student experience at Vanderbilt. The Office of Active Citizenship and Service (OACS) aims to expose students to a wide variety of perspectives and experiences aimed at educating the whole person while cultivating lifelong learning. By creating applied community service programs that give students the opportunity to engage, to question, and to create change locally and globally, OACS helps students achieve personal growth through meaningful, collaborative action. OACS supports, encourages, and advises Vanderbilt students and nearly seventy student organizations to become involved in a wide array of active citizenship and service opportunities. These service opportunities explore topics such as health care, education, social enterprise, and community development.

OACS programming includes active community engagement in Nashville through a variety of service initiatives, including the 9/11 and Martin Luther King Jr. Weekends of Service. The office coordinates global service-learning programs around the world in Morocco, Ecuador, England, and South Africa, as well as assisting student organizations with a variety of service learning programs, both domestic and international.

OACS empowers students not only to build relationships with other students and partners in the greater Nashville community, but also challenges students to seek new information and to critically analyze the nuanced concepts of service and advocacy. The OACS motto, *Explore. Act. Reflect.*, celebrates Vanderbilt's mission of creative engagement, open inquiry, equity, and compassion.

### Student Centers

A variety of facilities, programs, and activities are provided in five separate student center locations—Alumni Hall, The Commons Center, Kissam Center, Sarratt Student Center|Rand Hall, and the Student Life Center.

Sarratt Student Center|Rand Hall is the main student center hub, housing a 300-seat cinema, art gallery, art studios, multicultural space, rehearsal rooms, large lounge spaces, large and small meeting spaces, and a courtyard. The facility is also home to Vanderbilt Student Communications, radio station, TV station, Last Drop Coffee Shop, and the Pub at Overcup Oak restaurant. Rand Hall houses the Rand Dining Center, campus store, student-operated businesses, the Anchor (student organization space), a multipurpose venue, meeting and seminar rooms, plus

large, open lounge space. Some of the offices located in Sarratt Student Center|Rand Hall include the Dean of Students, Greek Life, Leadership, and the Office of Active Citizenship and Service. Also included in this facility is a Ticketmaster™ outlet and a United States Postal Service office.

The Vanderbilt Student Life Center is the university's community keystone. It is both the fulfillment of students' vision to have a large social space on campus and a wonderful complement to Sarratt Student Center|Rand Hall. The Student Life Center has more than 18,000 square feet of event and meeting space, including the 9,000-square-foot Commodore Ballroom, which is one of the most popular spaces to have events on campus. The center is also home to the Career Center, International Student and Scholar Services, Global Education Office, and Global Support Services.

The Commons Center is the community crossroads of The Ingram Commons living and learning community. It has it all: the Dining Hall and great food; a living room with a concert-grade grand piano, and the occasional live musical performance; a small rec room with cardio equipment, free weights, and weight machines; meeting and study rooms; and academic support services like the Writing Studio, the Career Center, and the CASPAR premajor advising center. The third floor of The Commons Center is the home of the Department of Political Science.

Alumni Hall was the original student center on campus when the building opened in 1925. Re-opened in fall 2013 after a yearlong renovation that transformed every space in the facility, Alumni Hall has returned to its role as a student center after serving other purposes over the years. In the newly renovated Alumni Hall, students now have access to an exercise room as well as several new meeting and event spaces and the Bamboo Bistro. Two departments call Alumni Hall home, the Vanderbilt Institute for Digital Learning and, most recently, the Vanderbilt Graduate School.

Opened in fall 2014, Kissam Center is the fifth student center, and is part of the new Warren College and Moore College residential living-learning communities. A completely new facility, Kissam Center is home to more meeting and event spaces as well as the Kissam Market and Kissam Kitchen.

### **Vanderbilt Student Communications, Inc. (VSC)**

VSC has jurisdiction over campus radio stations, Vanderbilt Television, and undergraduate publications that are supported by the student activities fee. VSC functions chiefly to hire student leaders, supervise and audit financial records, maintain professional standards, and develop communications opportunities for students. VSC serves no programmatic or editorial function.

Among the divisions of the corporation are *The Vanderbilt Hustler*, the campus newspaper; the *Commodore* yearbook; *The Vanderbilt Review*, an annual literary/arts magazine; *The Torch*, a libertarian and conservative publication; *The Slant*, a humor publication; *Orbis*, an environmental issues publication; *The Vanderbilt Political Review*, an academic journal; WRVU, an online radio station; Vandy Radio, an online radio station; VUFinder, a documentary production group; *GlobalVU*, an international issues journal; Vandy Interactive, a gaming and software development group; *The Vanderbilt Historical Review*, an academic journal; *Synesis*; PEARL; RVU Records, a recording studio; and Vanderbilt Television, VTV Channel 6.

### **Recreation and Sports**

Physical education is not required for graduate and professional students, but almost two-thirds of Vanderbilt University students participate in club sports, intramurals, activity classes, or other programs offered at the Vanderbilt Recreation and Wellness Center (VRWC). The large variety of programs available for meeting students' diverse interests include: thirty-two club sports teams; forty intramural sports (softball, flag football, basketball, table tennis, and soccer); an aquatics program offering swim lessons for all ages and abilities. Red Cross lifeguarding and CPR classes are also available. If being outside is more your style, you can choose from one of more than twenty adventure trips offered each semester or create your own adventure trip with tips and gear from the Outdoor Recreation staff. There are more than eighty group fitness classes a week and a variety of wellness offerings from "learn to box" to healthy eating through Vandy Cooks in the demonstration kitchen, Personalized Nutrition Coaching, and Nutrition Minute grab-and-go information on a variety of nutrition topics.

The VRWC is a 289,000-square-foot facility that houses a 25-yard, 15-lane swimming pool; four courts for basketball, volleyball, and badminton; five racquetball and two squash courts; a four-lane bowling alley; five group fitness classrooms, more than 14,000 square feet of weight/fitness room space; rock-climbing wall; mat room; seven multipurpose rooms; locker rooms; and a 120-yard turf field surrounded by a 300-meter track in the indoor field house. VRWC's exterior spaces include a sand volleyball court and more than seven acres of field space including three natural grass fields and one turf field.

All students pay a mandatory recreation fee which supports the facilities, fields, and programs (see the chapter on Financial Information). Spouses must also pay a fee to use the facilities.

For additional information, please visit [vanderbilt.edu/recreationandwellnesscenter](http://vanderbilt.edu/recreationandwellnesscenter).

### *Varsity Athletics*

Students interested in more highly competitive sports on the varsity level will find challenges in intercollegiate athletics sanctioned by the Southeastern Conference, the Big East Conference, Southland Conference, and the NCAA. Women's teams compete in basketball, bowling, cross country, golf, lacrosse, soccer, swimming, tennis, and indoor and outdoor track and field. Men's teams compete in baseball, basketball, cross country, football, golf, and tennis. Women's lacrosse is in the Big East Conference. Women's bowling is in the Southland Conference. All other sports are in the Southeastern Conference.

### **Cultural Activities on the Campus**

Working through volunteer student committees that plan and execute the programs, the Office of the Dean of Students sponsors twelve to fifteen dance, music, and theater events each year, featuring renowned artists. Student committees select the artists and handle all arrangements for the performances.

Vanderbilt's cultural organizations annually produce festivals that showcase traditional and modern dances, art, music, and poetry to increase awareness of the many cultures represented on campus. The events include Asian New Year Festival by the Asian American Student Association, Diwali by Masala-SACE, and Café Con Leche by the Vanderbilt Hispanic Student Association to name just a few.

The Office of Arts and Campus Events coordinates numerous campus galleries that regularly exhibit contemporary artwork. The Sarratt Gallery, the student-run exhibition space in the Sarratt Student Center, holds monthly art receptions and gallery talks by visiting artists. Works from the university collection as well as special curated exhibits are on display in the gallery at the Bishop Joseph Johnson Black Cultural Center and the Fine Arts Gallery in Cohen Memorial Hall.

Vanderbilt University Theatre annually presents four major productions and several one-act plays for which all students are invited to audition. Other campus groups and touring companies also give dramatic presentations during the year.

The Vanderbilt Dance Program, housed in the dance studios at Memorial Gym, offers noncredit classes at all levels in a wide variety of dance styles, including ballet, modern, jazz, ballroom, hip hop, and ethnic dance. Master classes are given on a regular basis. The Vanderbilt Dance Program is home to five student dance companies. Each year auditions are held for Vibe, the student hip hop group; Vida, the student Latin dance company; Momentum, the student-run dance group; and Vanderbilt Dance Theatre, a company of students and community members. In addition, dance and drama auditions are held for the student-run Rhythm & Roots Performance Company in the fall. This group explores the use of performance art as an expression of social complexities and as a catalyst for social change. The student dance companies schedule performances throughout the year, and the Vanderbilt Dance Program sponsors a concert at the end of spring semester.

The Sarratt Art Studios host noncredit art classes in pottery, photography, jewelry, drawing, painting, fiber arts, mosaics, and stained glass. Classes and weekend workshops are taught by Nashville professional artists. The studios are located on campus in the Sarratt Student Center.

The Vanderbilt performing arts community represents more than thirty student groups devoted to providing opportunities for performers to showcase their talents. Student organizations that schedule annual performances range from comedy groups such as Tongue N' Cheek to the hip hop-based Spoken Word to the popular Juggling and Physical Arts Club to the musical theater of Vanderbilt Off-Broadway. Campus concerts are presented each year by the Concert Choir and Chamber Singers; Chamber Choir, Symphonic Choir, and Opera Theatre; Vanderbilt Orchestra and Chamber Orchestra; the Wind Ensemble and Jazz Band; and numerous student a cappella groups.

Outstanding scholars and speakers visit the university frequently, enriching the academic and cultural life of the campus in many ways. Various academic departments sponsor regular speaker programs, as do the student-initiated Impact Symposium, the Speakers Committee, and the Gertrude Vanderbilt and Harold S. Vanderbilt Visiting Writers program.

### **Inclusion Initiatives and Cultural Competence**

The Office of Inclusion Initiatives and Cultural Competence (IICC) is dedicated to the mission of promoting an environment of cultural competency, inclusivity, and awareness on the Vanderbilt campus. This is accomplished through creating intentional programming initiatives and training for students, faculty, and staff that promote social justice, an ability to instigate and participate in constructive conversations surrounding difference, and holistic identity development. IICC provides structured support to our multicultural, international student scholars, as well as students with disabilities, and fosters intentional partnerships with relevant offices on campus. The

efforts of IICC are helping to move Vanderbilt forward as an institution dedicated to all forms of racial, cultural, gender, religious, and sexual identity expression and equipping our students with the tools they need to effect change in an increasingly diverse world. For more information on the multicultural student organizations, programs, and trainings offered by IICC, visit [vanderbilt.edu/iicc](http://vanderbilt.edu/iicc). IICC operates under the auspices of the Dean of Students and is located in 337 Sarratt Student Center.

### **Office of Student Leadership Development**

The Office of Student Leadership Development is designed to serve as a conduit for leadership programming and a resource hub for students, faculty, and staff. The office believes in developing visionary, goal driven, and action oriented student leaders. Students who participate in leadership programs will be accountable to others, collaborative and team oriented, effective communicators, and service-oriented; practice moral decision making; and embrace diversity and inclusion.

The office sponsors signature leadership programs during the year, but also works closely with all areas within the Dean of Students office to ensure leadership programming occurs across all aspects of campus life. Programs emerging from this office will provide students with multiple points of entry and easy access to develop and enhance their leadership skills.

### **Center for Student Wellbeing**

The Center for Student Wellbeing seeks to create a campus culture that supports students in cultivating lifelong wellbeing practices. The center offers individual coaching appointments to help students develop and maintain skills that will contribute to personal and academic success, and provides workshops on a variety of topics, including resiliency, time management, alcohol and other drug education, and healthy living. Students may use the center's meditation room for yoga, meditation, and mindfulness classes, or for self-guided practice. The center also works closely with many campus partners, including the Psychological and Counseling Center, the Student Health Center, the Office of Housing and Residential Education, and the academic deans to provide resources and support for students who may be facing personal or academic challenges.

The Center for Student Wellbeing is centrally located on campus at 1211 Stevenson Center Lane, across from the Student Health Center, and is open Monday through Friday, 8:00 a.m. to 5:00 p.m. For more information, please call (615) 322-0480 or visit [vanderbilt.edu/healthydores](http://vanderbilt.edu/healthydores).

# Admission

**A**DMISSION as a freshman to Vanderbilt represents a selection based on the academic and personal records of applicants. All available information is considered, including secondary school academic record, evidence of academic maturity and independence, extracurricular activities, contributions to the school and community, and scores on standardized tests.

The admission process is designed to select a diverse student body with high standards of scholarship and personal character with serious educational aims. Policies that govern the selection process have been set by the dean of undergraduate admissions. Please refer to the nondiscrimination statement on the inside front cover.

Admission to the four undergraduate schools is managed by the Office of Undergraduate Admissions. Prospective students are encouraged to investigate the university by visiting the campus. Admissions staff are available to answer questions, arrange campus tours, provide additional information about degree programs, and link visitors with appropriate campus offices and members of the university community.

## Academic Preparation

A candidate for admission must present a transcript of work from an accredited secondary school and the recommendation of the guidance counselor or the head of school. The high school record must show at least fifteen academic units of college preparatory work (a unit is a year's study in one subject), with grades indicating intellectual ability and promise. The pattern of courses should show purpose and continuity and furnish a background for the freshman curriculum offered at Vanderbilt.

Specific entrance requirements are as follows:

*College of Arts and Science.* At least 4 units of English, 2 units of algebra, 1 unit of plane geometry, 2 units of one foreign language, 2 units of science, and 2 units of social science are required. Additional units of mathematics, foreign language, science, and social science are strongly recommended.

Applicants of ability and achievement who do not entirely meet these requirements may request special consideration. Students without the requisite units in English or mathematics may be admitted on condition that they make up the missing work prior to their first registration in the College of Arts and Science. Students without the requisite two years in foreign language must enroll during their first semester in a foreign language course and must remain continuously enrolled until they successfully complete a full year of one foreign language. They must complete this requirement before the end of their fourth semester in the College of Arts and Science.

*Blair School of Music.* At least 4 units of English, 2 units of algebra, 1 unit of geometry, 1 unit of history, 2 units of a foreign language, and 1 unit of science are required. Students with fewer units may be offered admission but must complete the missing work at Vanderbilt.

*Audition/Portfolio.* Applicants to the Blair School of Music are required to audition on their primary instrument (or in voice). Auditions will be held at the school on December 3, 2016; January 27–28, 2017; February 10–11, 2017; and February 24–25, 2017. Students seeking admission to the composition degree program must interview and present a portfolio of original compositions. All students are required to submit prescreening materials by January 1 (or November 1 for Early

Decision). See instructions for pre-screening on the Blair website. If applicants pass the prescreening portion of the application, they will receive a live audition invitation; please see the Blair website for instructions.

*School of Engineering.* At least 4 units of English, 2 units of algebra, 1 unit of geometry, 1 unit of trigonometry, and 4 units of science, including physics, are required. Two units of foreign language and 1 unit of history are also desirable.

*Peabody College.* It is strongly recommended that applicants have at least 4 units of English, 2 units of algebra, 1 unit of geometry, 2 units of science, and 1 unit of history.

## Application Procedure

1. Applicants may apply to Vanderbilt through the Coalition for Access, Affordability, and Success; the Common Application; QuestBridge; or the Universal College Application. Applications for admission are available online at *coalition-forcollegeaccess.org*, *commonapp.org*, *questbridge.org*, or *universalcollegeapp.com*. Regular Decision applicants must submit required parts of the application by January 1 for consideration for admission for the following fall semester. Certain scholarships require additional application materials and may have earlier deadlines. Interested students should visit *vanderbilt.edu/scholarships* for more information. Applications for admission submitted after January 1 will be considered, provided space is available. Admission decisions will be available by April 1.
2. Applicants must arrange for their high school to send an official transcript of their record to the Office of Undergraduate Admissions.
3. Applicants are responsible for having formal reports of their standardized test scores sent to Vanderbilt by the testing agency. Score reports appearing on official high school transcripts are acceptable for evaluation purposes, but official score reports are required.
4. The \$50 application fee is not refundable. A nonrefundable matriculation deposit of \$400 is required upon acceptance of the offer of admission. This deposit is credited to the student's account, and the amount is deducted from the bill for the first semester. Students with financial hardship may request a waiver of these fees.
5. Blair School of Music applicants must also submit a Blair School DecisionDesk Application, which includes a required prescreening video, by the January 1 deadline. Selected applicants will be invited to audition in person. See the Blair website for information and instructions about the Blair admissions process.

## Early Decision Plans

These plans are designed to give an early admission decision to well-qualified students whose first choice is Vanderbilt. In order to apply under the Early Decision plans, the student must complete the following steps:

1. Complete all parts of the application for admission and submit it with the appropriate Early Decision plan box checked and the \$50 nonrefundable application fee. November 1

is the deadline for Early Decision I, and January 1 is the deadline for Early Decision II.

2. Sign the Early Decision Agreement, stating that Vanderbilt is your first choice, affirming your intention to enroll at Vanderbilt if offered admission under the Early Decision plan, and agreeing to withdraw applications to other colleges if admitted. Your parent and guidance counselor must also sign this agreement.
3. Send an official high school transcript through the junior year to the Office of Undergraduate Admissions, along with a list of courses being taken and to be taken in the senior year.
4. Send Vanderbilt the official scores from the SAT Reasoning Test and/or the ACT. Scores appearing on official high school transcripts are acceptable for evaluation purposes, but official score reports are required.
5. Blair School of Music applicants must also submit a Blair School DecisionDesk Application, which includes required prescreening materials, by November 1 for Early Decision I or by January 1 for Early Decision II. Selected applicants will be invited to audition in person. See the Blair website for information and instructions about the Blair admissions process.

Applicants under the Early Decision plans may be admitted, denied admission, or deferred for later consideration in competition with all applicants at the regular decision process. Applicants who are deferred are encouraged to submit additional test scores, seventh semester grades, and any other information that may be helpful.

### Admission without Diploma

Certain students who are recommended by their high school principals and are considered by the Office of Undergraduate Admissions to be ready for college work may be admitted

following completion of their junior year in high school. This program of admission without high school diploma is intended to serve applicants of unusual promise who will benefit from beginning their college career a year early. Application should be made by January 1 of the junior year in high school. Additional examinations may be required. Other criteria will also be considered, such as maturity and motivation.

### A Note Regarding the Redesigned SAT

SAT Reasoning, Writing, Critical Reading, and Math scores mentioned in this catalog refer to the pre-March 2016 version of the test. For information on the redesigned SAT, please see [admissions.vanderbilt.edu/quickguide/#testing/](http://admissions.vanderbilt.edu/quickguide/#testing/).

### Advanced Credit

Honors courses and other accelerated study in high school are excellent preparation for Vanderbilt. The well-established advanced-placement policy endeavors to recognize exceptional high school preparation, to avoid requiring freshmen to take courses clearly mastered in high school, and to encourage students to begin their college learning experience at the level most appropriate to their preparation. Advanced placement may be granted on the basis of good performance on the College Board Advanced Placement Examinations, on International Baccalaureate tests, or, in some cases, on placement tests given by Vanderbilt. Credit may also be awarded for the British G.C.E. "A" level examinations, the Advanced International Certificate of Education (AICE), the Cambridge Pre-U diploma, and similar tests, such as the French *baccalauréat*, the German *abitur*, or the Swiss *maturité* examinations. To qualify for credit for the AICE examinations or individual A-level examinations, students must have achieved an A\*, A, or B thereon. More information on international exam credit is available at [registrar.vanderbilt.edu/international-examinations](http://registrar.vanderbilt.edu/international-examinations).

### Advanced Placement Credit Policy

Advanced Placement Examination grades accepted for advanced placement with credit by the various departments at Vanderbilt are listed below.

AP Exam	AP Score	Vanderbilt Course or Credit Equivalent	Credit Hours
<b>Art</b>			
<b>Art History</b>	4 or 5	HART 1110: History of Western Art I HART 1105: History of Western Art II	3 3
<b>Studio Art: 2-D Design</b>	4 or 5	ARTS No Equivalent: Art Studio	3
<b>Studio Art: 3-D Design</b>	4 or 5	ARTS No Equivalent: Art Studio	3
<b>Studio Art: Drawing</b>	4 or 5	ARTS No Equivalent: Art Studio	3
<b>Computer Science</b>			
<b>Computer Science A</b>	5	CS 1101: Programming & Problem Solving	3
<b>Economics</b>			
<b>Macroeconomics</b>	4 or 5	ECON 1010: Principles of Macroeconomics	3
<b>Microeconomics</b>	4 or 5	ECON 1020: Principles of Microeconomics	3
<b>English</b>			
<b>English Language &amp; Composition</b>	4 or 5	ENGL 1300W: Intermediate Composition	3
<b>English Literature &amp; Composition</b>	4 or 5	ENGL 1220W: Drama: Forms and Techniques ENGL 1230W: Literature and Analytical Thinking	3 3
<b>Government and Politics</b>			
<b>Government &amp; Politics: Comparative</b>	4 or 5	PSCI 1101: Introduction to Comparative Politics	3
<b>Government &amp; Politics: United States</b>	4 or 5	PSCI 1100: Introduction to American Government and Politics	3

**History**

<b>European History</b>	4 or 5	HIST No Equivalent: European History	3
<b>United States History</b>	4 or 5	HIST No Equivalent: U.S. History	3
<b>World History</b>	4 or 5	HIST No Equivalent: World History	3

**Human Geography**

No Credit

**Languages**

<b>Chinese Language and Culture</b>	4	CHIN 2201: Intermediate Chinese I	5
<b>Chinese Language and Culture</b>	5	CHIN 2202: Intermediate Chinese II	5
<b>French Language</b>	4 or 5	FREN 2203: Contemporary Francophone Cultures	3
		FREN 2501W: French Composition and Grammar	3
<b>French Literature</b>	4 or 5	FREN 2203: Contemporary Francophone Cultures	3
		FREN No Equivalent: French Literature	3
<b>German Language</b>	4 or 5	GER 2201: Intermediate German I	3
		GER 2202: Intermediate German II	3
<b>Italian Language and Culture</b>	4 or 5	ITA 2203: Italian Journeys	3
		ITA 2501W: Grammar and Composition	3
<b>Japanese Language &amp; Culture</b>	4	JAPN 2201: Intermediate Japanese I	5
<b>Japanese Language &amp; Culture</b>	5	JAPN 2202: Intermediate Japanese II	5
<b>Latin</b>	4 or 5	LAT 2202: Intermediate Latin: Poetry	3
<b>Spanish Language or Literature</b>	4	SPAN 2203: Intermediate Spanish	5
<b>Spanish Language or Literature</b>	5	SPAN 2203: Intermediate Spanish	5
		SPAN 3302: Spanish for Oral Communication through Cultural Topics	3

**Mathematics**

<b>Calculus AB</b>	5	MATH 1300: Accelerated Single-Variable Calculus I	4
<b>Calculus BC &amp; AB Subscore</b>	3 & 5	MATH 1300: Accelerated Single-Variable Calculus I	4
<b>Calculus BC &amp; AB Subscore</b>	4 & 5	MATH 1300: Accelerated Single-Variable Calculus I	4
<b>Calculus BC</b>	5	MATH 1300: Accelerated Single-Variable Calculus I	4
		MATH 1301: Accelerated Single-Variable Calculus II	4

**Music**

<b>Music Theory</b>	5	MUTH 1200: Survey of Music Theory	3
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No course credit awarded for music majors

**Psychology**

<b>Psychology</b>	5	PSY 1200: General Psychology	3
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**Sciences**

<b>Biology</b>	4 or 5	BSCI 1100: Biology Today	3
		BSCI 1100L: Biology Today Laboratory	1
<b>Chemistry</b>	5	CHEM 1601: General Chemistry	3
		CHEM 1601L: General Chemistry Laboratory	1
		CHEM 1602: General Chemistry	3
		CHEM 1602L: General Chemistry Laboratory	1
<b>Environmental Science</b>		No Credit	
<b>Physics 1</b>	5	PHYS 1010: Introductory Physics	3
		PHYS 1010L: Introductory Physics Lab	1
None of the credits awarded for Physics 1 shall count toward the major or the minor in physics. No credit awarded for engineering students.			
<b>Physics 2</b>	5	PHYS No Equivalent	4
None of the credits awarded for Physics 2 shall count toward the major or the minor in physics. No credit awarded for engineering students.			
<b>Physics B</b>	5	PHYS 1010: Introductory Physics	3
		PHYS 1010L: Introductory Physics Laboratory	1
No credit awarded for engineering students; not to be awarded if student also has credit for Phys 1601/1601L or Phys 1602/1602L.			
<b>Physics C: Electricity &amp; Magnetism</b>	5	PHYS 1602: General Physics II	3
		PHYS 1602L: General Physics Laboratory II	1
<b>Physics C: Mechanics</b>	5	PHYS 1601: General Physics I	3
		PHYS 1601L: General Physics Laboratory I	1

**Statistics**

<b>Statistics</b>	4 or 5	MATH 1010: Probability and Statistical Inference	3
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No credit awarded for engineering students

At the determination of individual departments, Advanced Placement Examination grades with a score of 4 or 5 may be accepted for credit. The amount of credit that may be awarded corresponds to the course work waived. Advanced Placement credit does not affect the Vanderbilt grade point average.

Students of the College of Arts and Science are limited to a total of 18 credit hours earned by any combination of advanced placement, international baccalaureate credit, advanced international credit, and credit by departmental examination, counting toward the minimum number of hours required toward the degree. No form of advanced placement credit can be used in fulfillment of the Achieving Excellence

in Liberal Education (AXLE) requirements for students in the College of Arts and Science.

### International Baccalaureate Credit Policy

International Baccalaureate test scores accepted for advanced credit by the various departments at Vanderbilt are listed below. Students who have taken tests in other areas may submit their scores to the Office of Academic Services for evaluation by the appropriate departments. Credits are awarded for exams taken at the higher level only. The amount of credit that may be awarded is subject to the same limitations as credit for Advanced Placement.

IB Certificate Subject	IB Score	Vanderbilt Course or Credit Equivalent	Credit Hours
<b>Biology (Higher)</b>	6 or 7	BSCI 1100: Biology Today	3
		BSCI 1100L: Biology Today Laboratory	1
<b>Chemistry (Higher)</b>	6 or 7	CHEM 1601: General Chemistry	3
		CHEM 1601L: General Chemistry Laboratory	1
		CHEM 1602: General Chemistry	3
		CHEM 1602L: General Chemistry Laboratory	1
<b>Economics (Higher)</b>	6 or 7	ECON 1010: Principles of Macroeconomics	3
		ECON 1020: Principles of Microeconomics	3
<b>English (Higher)</b>	6 or 7	ENGL 1220W: Drama: Forms and Techniques	3
		ENGL 1230W: Literature and Analytical Thinking	3
<b>French (Higher)</b>	6 or 7	FREN 2203: Contemporary Francophone Cultures	3
		FREN No Equivalent: Elective Credit	3
<b>History (Higher)</b>	6 or 7	HIST No Equivalent: History Elective	3
<b>Japanese (Higher)</b>	6 or 7	JAPN 3301: Advanced Japanese I	3
		JAPN 3302: Advanced Japanese II	3
<b>Latin (Higher)</b>	6 or 7	LAT 2201: Intermediate Latin: Prose	3
		LAT 2202: Intermediate Latin: Poetry	3
<b>Mathematics (Higher)</b>	6 or 7	MATH 1010: Probability and Statistical Inference	3
		MATH 1300: Accelerated Single Variable Calculus I	4
		MATH No Equivalent: Math elective credit	1
		No credit for Math 1010 for engineering students.	
<b>Music (Higher)</b>	6 or 7	MUSL No Equivalent (may count toward a music major)	3
<b>Physics (Higher)</b>	7	PHYS 1601: General Physics I	3
		PHYS 1601L: General Physics Laboratory I	1
		PHYS 1602: General Physics II	3
		PHYS 1602L: General Physics Laboratory II	1
<b>Psychology (Higher)</b>	6 or 7	PSY 1200: General Psychology	3
<b>Russian (Higher)</b>	6 or 7	RUSS 2201: Second-Year Russian	3
		RUSS 2202: Second-Year Russian	3
<b>Spanish (Higher)</b>	6 or 7	SPAN 2203: Intermediate Spanish	5
		SPAN 3302: Spanish for Oral Communication through Cultural Topics	3
<b>Visual Arts (Higher)</b>	6 or 7	ARTS No Equivalent: Visual Arts	3
		ARTS No Equivalent: Visual Arts	3



## Pre-College Summer School Program

Upon completion of the sophomore or junior year in high school, students may enroll, at the freshman level, for regular work in the Vanderbilt summer session.

The following conditions must be met: (a) students must be in the upper 25 percent of their high school class and be recommended by their principal or counselor; (b) courses taken in the Vanderbilt summer session must be chosen by the student in consultation with his or her high school counselor and the director of the Division of Unclassified Studies so as to supplement and not overlap the total high school program. A student may take two courses in any one summer, or three courses by special authorization of the director of the Division of Unclassified Studies.

Course work done at Vanderbilt by a pre-college student may count toward the high school diploma and as part of the entrance requirements for regular admission to Vanderbilt. All course work done at Vanderbilt by pre-college students will be credited toward the degree for those who may subsequently matriculate at Vanderbilt, unless the course work is required for high school graduation. Admission to the pre-college summer school program does not admit a student as a regular entering freshman, nor does it commit the university to a student's admission.

## Credit for Previous College Work

Entering first-year students who have taken college work during their junior or senior year in high school through dual enrollment or concurrent enrollment programs, or during summers prior to their offer of admission to Vanderbilt, must report such work to the Office of Undergraduate Admissions if they wish it to be reviewed for credit. At the student's request, the dean of the appropriate undergraduate school will determine whether such work may be credited toward the Vanderbilt degree. Vanderbilt credit will not be rewarded for college courses taken to meet the minimum entrance requirements of 15 high school units.

*The question of credit at Vanderbilt must be settled in advance of the student's final registration.*

Credit will be awarded only if:

1. A course is regularly offered by an accredited two-year or four-year college or university;
2. The teacher was a regular faculty member of that college or university; and
3. A majority of the students in the course were candidates for a degree at that college or university.

The College of Arts and Science and Peabody College usually do not award credit for work at other colleges in the summer immediately preceding the student's first semester at Vanderbilt. Summer work elsewhere will be accepted for credit only if an unusual educational opportunity can be demonstrated and if the courses sought are as rigorous as courses offered at Vanderbilt. Approval for work to be taken elsewhere must be obtained in advance from the appropriate dean.

*College of Arts and Science.* In no case may credits completed elsewhere after the student has been offered admission by the College of Arts and Science satisfy AXLE requirements.

## International Students

Vanderbilt has a large international community representing more than 119 countries. The university welcomes the diversity international students bring to the campus and encourages academic and social interactions at all levels.

*Admission.* Students from other countries are required to complete all the admission requirements of the university. Applicants whose first language or language of instruction is not English are required to submit the results of the Test of English as a Foreign Language (TOEFL), the International English Language Testing Service (IELTS), or the Pearson Test of English Academic (PTE Academic). This testing requirement may be waived if a student has scored above 600 on the SAT Critical Reading or above a 26 on the ACT English section. Minimum recommended scores for Vanderbilt are 100 on the internet-based TOEFL, 230 on the computer-based TOEFL, 7.0 on the IELTS, and 70 on the PTE Academic.

*English Language Instruction.* Entering students who are not fully proficient in English may be required to take language support courses concurrently with their academic courses at the Vanderbilt English Language Center (ELC). Academic studies may continue after recommendation by the ELC in consultation with the student's academic adviser. For information about Vanderbilt's English language program, visit [vanderbilt.edu/elc](http://vanderbilt.edu/elc).

*Financial Resources.* To meet requirements for entry into the United States for study, applicants must demonstrate that they have sufficient financial resources to meet the expected costs of their educational program. Applicants must provide documentary evidence of their financial resources before visa documents can be issued.

United States laws and regulations restrict the opportunity for international students to be employed. Undergraduate international students are allowed to work on campus for nineteen hours per week while school is in session. Students may be allowed to work off campus only under special circumstances. Many spouses and dependents of international students are not allowed to be employed while in the United States.

Limited need-based financial aid is available to students who are neither citizens nor permanent residents of the United States. To apply for need-based financial aid, students are required to submit the College Scholarship Service (CSS) Financial Aid Profile. Admission for international students is "need-aware"; the larger the amount of financial aid needed, the greater the competition for admission.

*Student Injury and Sickness Insurance.* International students are automatically enrolled in the Vanderbilt University-approved International Student Injury and Sickness Insurance Plan. The student may waive this requirement if comparable coverage is provided by an alternate insurance plan and will be effective throughout the policy year. Information concerning the limits, exclusions, and benefits of this insurance coverage may be obtained from Student Health Services.

*Information.* Assistance in nonacademic matters before and during the international student's stay at Vanderbilt is provided by Vanderbilt's International Student and Scholar Services. For more information, visit [vanderbilt.edu/iss](http://vanderbilt.edu/iss).

## Transfer Students

Admission of transfer students to Vanderbilt is competitive, with the primary criterion being academic merit. The priority deadline for transfer admission is March 15. It is our practice to offer transfer admission for the fall semester only.

To be considered for transfer admission to Vanderbilt, applicants must submit all required parts of either the Coalition Application Transfer Application, the Common Application Transfer Application, or the Universal College Application Transfer Application and satisfy the following conditions:

1. Provide official test results from either the SAT Reasoning Test and/or the ACT;
2. Provide a Transfer College Report and be in good standing at the institution last attended;
3. Provide an official secondary school transcript;
4. Provide official transcripts from each college attended;
5. Submit two academic letters of recommendation;
6. Agree to attend a Vanderbilt undergraduate program for at least four semesters (at least 60 hours) of full-time work. Two of these semesters (at least 30 hours) must be within the senior year.

Work presented for transfer must be from an accredited college and is subject to evaluation in light of the degree requirements of this university.

Work transferred to Vanderbilt from another institution will not carry with it a grade point average. No course in which a grade below C- was received will be credited toward a degree offered by the university.

*College of Arts and Science.* Transfer students must complete at least 60 hours of work in the College of Arts and Science. Credit earned as a degree-seeking student at another university may be used to fulfill AXLE requirements.

*Blair School of Music.* In addition to an application for admission, transfer students applying to Blair must also submit a Blair School DecisionDesk Application, which includes a required prescreening video, by the March 15 deadline. Selected applicants will be invited to audition in person. See the Blair website for information and instructions about the Blair admissions process. Transfer students will be assigned a level of program study based on the entrance audition. Credit for music courses may be granted following an examination at Blair. Credit for non-music courses is subject to evaluation by the College of Arts and Science. Transfer students must complete at least 63 hours at Blair.

*School of Engineering.* Transfer students must complete at least 60 hours of work in the School of Engineering.

*Peabody College.* Transfer students must complete at least 60 hours of work at Peabody. Two of the four semesters in residence must be the last two semesters of the student's degree program.

## Intra-University Transfer

Undergraduate students in the College of Arts and Science, Blair School of Music, School of Engineering, and Peabody College may request a transfer between the schools. Students are eligible for intra-university transfer after having been enrolled on a full-time basis at Vanderbilt for two semesters. To be eligible for transfer, students must meet the requirements of the school they wish to enter.

Applications are available on the University Registrar website, [registrar.vanderbilt.edu/intra-university-transfers/](http://registrar.vanderbilt.edu/intra-university-transfers/), and should be submitted to the Office of the University Registrar by the required deadlines listed on this webpage.

Students seeking transfer between schools within the university must meet the following requirements: (a) a student who has been in residence for two regular semesters must have a minimum of 24 hours and a cumulative grade point average of 1.800; (b) a student who has been in residence for three regular semesters must have a minimum of 39 hours and a cumulative grade point average of 1.850; (c) a student who has been in residence for four regular semesters must have a minimum of 54 hours and a cumulative grade point average of 1.900; (d) a student who has been in residence for five regular semesters must have a minimum of 69 hours and a cumulative grade point average of 1.950.

Individual schools and/or majors may impose additional restrictions beyond the minimum requirements listed above. Students applying to the Blair School of Music must audition as part of the process. Transfer applicants to the School of Engineering should present at least two semesters of college calculus, one semester of calculus-based physics, and (for transfer to biomedical engineering or chemical engineering) two semesters of college chemistry. Advanced Placement or International Baccalaureate credit, if accepted by Vanderbilt, can be used to meet these requirements.

## Division of Unclassified Studies

The Division of Unclassified Studies provides an opportunity to take undergraduate courses at Vanderbilt as follows: (a) adults not interested in working toward a degree, (b) visiting students working toward a degree at another institution (students in this category may not remain enrolled in the division for more than two regular semesters and one summer session), and (c) rising junior and senior students in high school who have received special permission to enroll in courses for college credit.

Such students register in the Division of Unclassified Studies. Records are kept of their work, and a transcript may be made available to them as it would be if they were regularly enrolled at Vanderbilt. Work taken in the division may be transferred to a degree-granting unit of the university provided it is work that will count as part of the program of that unit. Work so transferred may not amount to more than one-fourth of the requirements for the Vanderbilt degree. Requests for transfer to a Vanderbilt degree-granting school must be made to the Office of Undergraduate Admissions. Division of Unclassified Studies students are not eligible for intra-university transfer.

Students who want to enroll in the Division of Unclassified Studies must apply and be admitted to the division at least two weeks before the first day of classes for the term they wish to attend. Requests for exceptions to the admission criteria must be addressed in writing to the vice provost for university enrollment affairs and dean of admissions and financial aid, whose decision is final.

All university regulations, including the Honor System, apply to students registered in the Division of Unclassified Studies.

Degree candidates have priority in enrollment at Vanderbilt, and students registering in the Division of Unclassified Studies should be prepared for this contingency. DUS students must meet all course prerequisites. Permission of the Office of the Dean is required for enrollment in some courses. Tuition is charged at the standard rate.

Division of Unclassified Studies students are not charged student activity, recreation center, or health insurance fees, and do not have access to recreation or student health services. Those enrolled in the division as full-time students (particularly visiting students or others living in campus residence halls) may petition to be allowed to purchase these services.

### Summer Session

The ten-week summer session begins in early June and ends early in August. In addition, some units of the university offer an accelerated four-week Maymester. Vanderbilt offers the summer program for regularly enrolled students at the university, for part-time students, and for students enrolled during the regular year in other colleges and universities (visiting students).

Summer courses are normally offered by the College of Arts and Science, Blair School of Music, the School of Engineering, the Graduate School, the School of Nursing, and Peabody College.

Some courses extend over the entire summer session and complete the work of a full semester. Others are offered in modular units of eight, six, five, or four weeks, for full semester credit. Still other summer courses complete a full semester's work in the first five-week or second five-week half

of summer session, with classes meeting twice as many hours per week. In full-year courses offered in summer, the work of the first semester is covered in the first half-session, the work of the second semester in the second half.

Classrooms, residence halls, libraries, and dining halls are air conditioned. The Vanderbilt Recreation and Wellness Center and other athletic facilities are open in the summer. Information about the summer session is available on request from the Division of Unclassified Studies or from each school's Office of Academic Services. Students may also go to [vanderbilt.edu/summersessions](http://vanderbilt.edu/summersessions) for additional information.

### Maymester

In the interval of several weeks between final examinations in the spring semester and the beginning of summer session, Vanderbilt offers educational travel opportunities and a variety of "total immersion" courses that would be difficult to offer during a regular semester.

Students are permitted to take no more than one course during the Maymester. Housing and food services are available during the session. Visiting students are eligible for Maymester courses.

Information about May courses on campus or abroad can be found at [vanderbilt.edu/summersessions](http://vanderbilt.edu/summersessions).

# Financial Information

**T**UITION for undergraduates for the 2016/2017 academic year is \$44,496 (\$22,248 a semester). A \$650 equipment fee is charged for students enrolled in the School of Engineering (in addition, freshmen entering the School of Engineering are required to own a laptop computer, with an estimated cost of \$1,500). A full-time undergraduate student takes 12 to 18 hours. Students taking more than 18 hours per semester are charged \$1,854 per hour for each extra hour. Students who, for approved reasons, enroll for fewer than 12 hours are charged \$1,854 per hour, with a minimum tuition charge of \$1,854 per semester. The \$400 deposited with the Office of Undergraduate Admissions when the student is accepted is applied to the bill for the first semester.

Rates for tuition and fees are set annually by the Board of Trust and are subject to review and change without further notice.

## Estimate of Expenses

Basic expenses (excluding travel and personal expenses) should be approximately \$63,820 a year, itemized as follows:

Tuition (2016/2017)	\$44,496
Room and board (estimate)	14,962
Books and supplies (estimate)	1,370
Student activities and recreation fees (estimate)	1,114
Student health insurance	1,878

## Other Academic Fees

Application fee	\$50
First-Year Experience fee (year)	732
Engineering equipment fee (year)	650
Late registration fee	30
Senior-in-absentia minimum semester tuition charge (hourly rate)	1,854
Special examination fee	5
Credit by departmental examination fee	50
Transcript fee (one time only)	30

Self-service registration concludes on the sixth day of the term.

Students who have not registered by the published dates may be subject to late registration fees. Registration dates are published in the Academic Calendars.

## Payment of Tuition and Fees

Tuition, fees, and all other university charges incurred prior to or at registration are due and payment must be received by August 17 for the fall semester and January 3 for the spring semester. If courses are added AFTER the initial billing period, it is the student's responsibility to contact the Office of Student Accounts for due dates and amounts related to tuition in order to avoid any holds and/or late payment penalties. All other charges incurred after classes begin are due and payment must be received in full by the last business day of the month in which they are billed to the student. If payment is not made within that time, Commodore Cash and Meal Money may not be available and your classes may be canceled. Visit [vanderbilt.edu/stuacct](http://vanderbilt.edu/stuacct) for payment options.

Students/Guarantors will be responsible for payment of all costs, including reasonable attorney fees and collection agency fees, incurred by the university in collecting monies owed to the university. The university will assess a \$25.00 fee for any check or e-payment returned by the bank and reserves the right to invoke the laws of the State of Tennessee governing bad check laws.

## E-Billing and Access to a Student's Vanderbilt Account

Vanderbilt exclusively uses convenient and secure electronic billing (e-bills) for student account charges. **Students may need to take action** to enable parents, guardians, and other "invited payers" to receive e-bill notices and access to the e-bill website. Students may access their online invoices from their YES landing page at [yes.vanderbilt.edu](http://yes.vanderbilt.edu). Once they have signed in to YES, they may view invoices under the Billing Portal link.

**Students are responsible for granting access to parents, guardians, or other payers who should receive email billing notifications.** To do this, students log in to YES and click the "billing portal link." On your CashNet Account page, click "Add New" in the "Other Payers" section. Enter the information that is requested, and click "OK." (You must enter the "login name" that your authorized payer will use as a username—the logon and password will be sent to your authorized payer in an email.) Tutorials are located online at [vanderbilt.edu/stuacct/ebill.html](http://vanderbilt.edu/stuacct/ebill.html).

Any month in which there is activity on the student's account, an e-bill will be generated and an email notification sent to the student's Vanderbilt email address, as well as to the email addresses of others they have invited. The email notification will have the subject line "Your E-Bill Is Now Available for Viewing" and will contain a link to the secure e-bill website.

Payments may be made electronically, or for those wishing to mail a payment, a payment coupon can be printed. When an electronic payment is made, a confirmation email will be sent. **It remains the responsibility of the student to ensure that bills are paid on or before the due date.**

The Office of Student Accounts can be contacted at (615) 322-6693, toll-free at (800) 288-1144, or via email at [student.accounts@vanderbilt.edu](mailto:student.accounts@vanderbilt.edu). For additional information, please visit the Student Accounts website at [vanderbilt.edu/stuacct](http://vanderbilt.edu/stuacct).

## Refunds of Tuition and Housing Charges

University policy for the refund of tuition and housing charges provides a percentage refund based on the time of withdrawal. Students who withdraw officially or are dismissed from the university for any reason may be entitled to a partial refund in accordance with the established schedule below. Students who register for more than 18 hours and later reduce their registration to 18 hours or fewer may be entitled to a partial refund of the extra tuition for hours over 18 in accordance with the same schedule. Fees are nonrefundable.

Tuition Refund Insurance is offered through the Office of Student Accounts. This elective plan provides coverage for tuition and housing in the event a student withdraws from school due to medical reasons. Go to [collegerefund.com](http://collegerefund.com) for more information or to apply online.

**Fall 2016 Withdrawal/Refund Schedule**

Week 1	August 24–August 31	100%
Week 2	September 1–September 7	90%
Week 3	September 8–September 14	85%
Week 4	September 15–September 21	80%
Week 5	September 22–September 28	75%
Week 6	September 29–October 5	65%
Week 7	October 6–October 12	60%
Week 8	October 13–October 19	50%
Week 9	October 20–October 26	45%
Week 10	October 27–November 2	40%

*Fall Break October 13–14*

*No refund after November 2, 2016*

**Spring 2017 Withdrawal/Refund Schedule**

Week 1	January 9–January 16	100%
Week 2	January 17–January 23	90%
Week 3	January 24–January 30	85%
Week 4	January 31–February 6	80%
Week 5	February 7–February 13	75%
Week 6	February 14–February 20	65%
Week 7	February 21–February 27	60%
Week 8	February 28–March 15	50%
Week 9	March 16–March 22	45%
Week 10	March 23–March 24	40%

*Spring Break March 4–12*

*No refund after March 24, 2017*

**Payment Options**

**Direct Payment:** Tuition, fees, and all other charges are paid directly to the university. Payment for the fall semester is due by August 17, 2016. Payment for the spring semester is due by January 3, 2017. Students can pay online after viewing their e-bill at [vanderbilt.edu/stuaccts](http://vanderbilt.edu/stuaccts). There is no further action required for this option.

**Interest-Free Monthly Payment Plan:** Students can spread payment over five monthly installments for each semester (fall and spring), interest free, by enrolling in the VANDYPlan, currently administered by Higher One. The deadline to enroll in the VANDYPlan is August 31, 2016, for the fall semester (payments begin May 15) and January 31, 2017, for the spring semester (payments begin October 15).

The current estimated charges for the 2016/2017 academic year are available at [vanderbilt.edu/stuaccts](http://vanderbilt.edu/stuaccts) to assist students in determining their annual expenses. For further information, please contact the Office of Student Accounts at (615) 322-6693 or (800) 288-1144.

**Late Payment of Fees**

All charges not paid by the specified due dates will be assessed a late payment fee of \$1.50 on each \$100 owed (minimum late fee of \$5).

**Financial Clearance**

Transcripts (official or unofficial) will not be released until the account has been paid. Diplomas of graduating students will not be released until all indebtedness to the university is cleared.

**Activities and Recreation Fees and Identification Card**

All degree-seeking undergraduate students pay activities and recreation fees that entitle them to admission to certain athletic, social, and cultural events and to subscription to certain campus publications. Specific information on these fees is published annually in the *Student Handbook*. The undergraduate student's identification card will admit students to university activities and the Vanderbilt Recreation and Wellness Center. It is also used as a library card and to stamp other documents. The card should be carried at all times and be returned to the university if the student withdraws for any reason.

The student activities fee and the student recreation fee will be waived automatically for the fall and spring semesters if the undergraduate student is a part-time student registered for four or fewer credit hours. Part-time undergraduate students wishing to use the Vanderbilt Recreation and Wellness Center will be required to pay the recreation center membership fee for access. For more information, please see [vanderbilt.edu/recreationandwellnesscenter](http://vanderbilt.edu/recreationandwellnesscenter).

**Transcripts**

Official academic transcripts are supplied by the University Registrar on authorization from the student. Transcripts are not released for students with financial or other university holds.

**Fraternity and Sorority Membership**

There is a financial commitment associated with joining a fraternity or sorority. The costs go toward inter/national fees, chapter operating expenses, and social functions. Financial obligations differ for men and women and among individual chapters. New members can expect to pay higher dues their first semester. Many chapters participate in the Facility Management Program, and members pay \$322 each semester, charged to their student account, for the maintenance and upkeep of the chapter house. Dues range from \$750 to \$1,300 for Interfraternity Council (IFC) men, \$700 to \$1,200 for Pan-Hellenic women, and \$125 to \$500 for National Pan-Hellenic Council (NPHC) men and women per semester. Additional costs throughout the semester may be for meal plans, conference attendance, philanthropic contributions, pictures, gifts, parties, T-shirts, etc. Chapter fees are paid directly to the fraternity or sorority. There are payment plans available to students, as well as scholarships within the individual chapters.

**Need-Based Financial Aid**

Vanderbilt is committed to accessibility and affordability for all admitted and enrolled students. Grants, scholarships, and work opportunities are available to eligible students who apply for assistance and have demonstrated financial need. Beginning in the fall of 2009, financial aid packages offered to incoming and current undergraduate students no longer included need-based loans. While continuing to meet the full demonstrated need of all eligible students, this expanded aid initiative, Opportunity Vanderbilt, announced in October 2008 provides increased amounts of need-based grants and/or scholarships (gift assistance) to replace need-based loans that would have otherwise been offered to meet a student's demonstrated financial need.

Demonstrated financial need is the difference between the cost of attending Vanderbilt and the amount that students and their families are expected to contribute toward that cost. The amount of aid to fully meet each student's demonstrated

financial need is determined annually on the basis of current financial information required/provided on relevant application forms.

### Application Procedure

Prospective students need to complete a Free Application for Federal Student Aid (FAFSA) and a College Scholarship Service PROFILE. The FAFSA may be completed online at [fafsa.ed.gov](http://fafsa.ed.gov). Students may complete the CSS PROFILE online at [collegeboard.org](http://collegeboard.org). The student must submit the FAFSA and PROFILE no later than February 1 of the senior year in high school. Further information regarding the application process is available from the Office of Student Financial Aid and Scholarships at [vanderbilt.edu/financialaid](http://vanderbilt.edu/financialaid).

Students must reapply for financial aid each year by submitting a CSS PROFILE and the FAFSA by April 15 of each year. Renewal applicants must be in good standing and making satisfactory academic progress in order to continue receiving federal and institutional student aid funds. Renewal of university need-based assistance requires a minimum cumulative GPA of 2.0 for the sophomore, junior, and senior years. The priority consideration date for filing renewal applications is April 15.

### Financial Aid for Early Decision Applicants

Early Decision applicants seeking financial aid must complete the College Scholarship Service PROFILE to be considered for Vanderbilt need-based grant assistance. Students may complete the CSS PROFILE online at [collegeboard.org](http://collegeboard.org). Early Decision I applicants should complete the CSS PROFILE no later than November 8 of the senior year in high school. Early Decision II applicants should complete the CSS PROFILE process no later than January 2 of the senior year in high school. Students will receive an estimate of their eligibility for financial aid with their offer of admission. The student must then file the FAFSA no later than February 1. The original estimated aid award will be confirmed or revised, as appropriate, after the FAFSA and CSS PROFILE together are reviewed by the Office of Student Financial Aid and Scholarships.

### Federal Title IV Aid

Financial aid is available from several Federal Title IV student financial aid programs. Any citizen or eligible non-citizen of the United States who is accepted for admission and who demonstrates financial need is eligible to participate. This aid may be renewed annually by students who continue to qualify on the basis of financial need, if they are in good academic standing and are making satisfactory academic progress in accordance with standards prescribed by the U.S. Department of Education. (See Satisfactory Academic Progress.)

The FAFSA establishes eligibility for participation in federal aid programs. The loan programs also require completion of loan applications and/or promissory notes. Applicants should contact their state agencies for information regarding state aid programs and application procedures.

Vanderbilt participates in the following federal student financial aid programs:

- Federal Pell Grant Program
- Federal Supplemental Educational Opportunity Grant Program (FSEOG)
- Federal Work-Study Program (FWSP)
- Federal Perkins Loan Program
- Federal Direct Loan Program

### Federal Direct Parent Loan for Undergraduate Students (PLUS)

In addition to the federal student financial aid programs, Vanderbilt administers a number of need-based institutional scholarship, grant, and loan programs, some of which are described briefly in the Scholarship section of this catalog. University general sources of need-based assistance and loan funds available to students in all schools are listed.

### Satisfactory Academic Progress Standards for Undergraduate Students

Academic progress for students receiving Vanderbilt University (institutional) need-based and/or federal Title IV financial assistance will be reviewed at the end of each academic term. Students must be meeting progress standards as defined by the Office of Student Financial Aid and Scholarships. These standards may be stricter than those defined in the academic standards applied by each of the individual undergraduate schools.

Institutional need-based aid assistance, including Vanderbilt need-based grants and scholarships, and federal Title IV financial aid are awarded for the academic year as determined by eligibility criteria for each financial aid program. Renewal and continuation of awards will be contingent upon maintaining satisfactory academic progress (SAP). The undergraduate requirements below are separate from the Academic Eligibility Policy required of all undergraduate students. Students must obtain a minimum grade point average outlined below. We realistically anticipate that the level of academic performance for each student will be higher than the minimum required cumulative GPA for renewal of Vanderbilt and federal financial aid programs. Students must successfully complete at least 2/3 (67%) of all credit hours attempted (Completed Hours / Attempted Hours = Completion Rate). Students must also complete their degree requirements within 150% of the length of your academic program. Undergraduate degrees require 120 completed credit hours, meaning the maximum timeframe is 180 attempted credit hours.

Satisfactory Academic Progress Standards

Grade Level	Cumulative GPA	Required earned credit hours
Freshman	1.8	0-23
Sophomore	1.8	24
Junior: Peabody and A&S	2.0	54
Junior: Blair and Engineering	2.0	54
Senior: Peabody and A&S	2.0	84
Senior: Blair and Engineering	2.0	86

All recipients who enroll full-time are expected to earn a minimum of 12 credits per semester.

Note: A reported grade of I or M are calculated as a zero grade point. The student is responsible for notifying the Office of Student Financial Aid if an earned grade is later received.

### Financial Aid Warning

For students who are making satisfactory progress, the award commitment for the subsequent year will normally be made

for the entire academic year. For students who fail to complete the required credit hours within the specified time frame and/or who fail to maintain the minimum GPA, the student will receive a **warning** and the financial aid commitment will be made for one subsequent semester only. Further review will be undertaken at the end of that semester. If the student fails to complete the required credit hours and/or fails to maintain the minimum GPA within the subsequent semester, institutional and/or federal financial aid will be **suspended**.

### Appeal Procedures

Any student whose institutional and/or federal Title IV student aid is **suspended** due to unsatisfactory academic progress may submit an appeal for reinstatement of such assistance to the Office of Student Financial Aid and Scholarships. The appeal for reinstatement should include the following elements:

- An explanation of extenuating circumstances, such as injury, illness, death of a relative, or other special circumstance as to why you failed to meet satisfactory academic progress requirements.
- An explanation of what has changed that will now allow you to demonstrate satisfactory academic progress at the end of the next semester.
- Supporting documentation from medical doctors, advisers, psychologists, etc., to verify the information you are including in your personal statement. Failure to provide information may result in your appeal being denied.

The student will be notified of the appeal approval or denial and if eligibility for institutional and/or federal financial aid funds will be reinstated for one additional semester on a **probationary** basis.

### Financial Aid Probation

At the end of a **probationary** semester, students must then meet Satisfactory Academic Progress for continued eligibility of financial assistance. If a student fails to meet Satisfactory Academic Progress all institutional and/or federal Title IV financial aid will be **suspended**. A student may make a subsequent appeal for continuation of such assistance to the Office of Student Financial Aid and Scholarships. A student's submitted appeal after a Probation status will be reviewed by an Institutional Appeal Committee. If it is determined that the student's failure to meet academic progress was the result of illness, death in the family, or other exceptional or mitigating circumstances, those factors will be considered in determining whether or not eligibility for federal and/or institutional student aid funds can be reinstated for one or more semester(s) while following a prescribed *Academic Plan* as defined by the Institutional Appeal Committee.

### Academic Plan

Students must meet the standards set forth in an *Academic Plan* that has been established to ensure that satisfactory academic progress will be met by a specific point in time in order to continue receiving institutional and/or federal Title IV financial assistance. Students who fail to earn the minimum credit hours and GPA specified in their established *Academic Plan* will have all financial assistance **suspended** until the academic deficiency is corrected.

### Reinstatement of Institutional and/or Federal Title IV Assistance

If students fail to progress as outlined above, they will not be eligible to receive further aid and will be notified that they may appeal for reinstatement of institutional and/or federal aid funds in any following/subsequent semester **after** the number of required credit hours to advance to the next higher level is achieved and/or their overall GPA has been raised to the minimum level. It will be the responsibility of the student to contact the Office of Student Financial Aid and Scholarships to request the reinstatement of his/her institutional and/or federal assistance.

### Maximum Aid Eligibility

*Vanderbilt University (institutional) need-based assistance:* A maximum time frame of four years (eight semesters or its equivalent) of full-time enrollment is established for attainment of their baccalaureate degree when determining eligibility for the receipt of institutional financial aid. Terms enrolled and credits earned at prior colleges/universities and accepted toward the student's undergraduate degree may be counted toward the maximum time frame for Vanderbilt financial assistance.

*Federal Title IV assistance:* A maximum time frame of 150% of the required credit hours to receive a degree or six years (twelve semesters or its equivalent) of full-time enrollment is established for attainment of the baccalaureate degree when determining eligibility for the receipt of funds through federal Title IV student financial aid programs.

### Student Employment

A primary source of information for students interested in part-time on- or off-campus employment is through access to an online job bank, *HireADore.com*. Many university, medical center, and off-campus employers post their open positions on *HireADore.com* at appropriate times throughout the year. The Federal Work Study (FWS) Program is a Federal Title IV program and eligibility for it is determined upon completion of the Free Application for Federal Student Aid (FAFSA) and other required application materials. Vanderbilt has positions available, on a limited basis, for both FWS and non-FWS eligible students. All students hired into on-campus positions will need to complete the federally required I-9 work authorization paperwork/process. The student employment function is coordinated out of the Office of Student Financial Aid and Scholarships located on campus at 2309 West End Avenue. More information may be found at [vanderbilt.edu/studentemployment](http://vanderbilt.edu/studentemployment) or by calling (615) 343-4562.

### University General Medals, Prizes, and Awards

Also see the Honors chapters in the College of Arts and Science, Blair School of Music, School of Engineering, and Peabody College sections of this catalog for listings of additional awards and prizes.

THE JESSICA ACESTE AND ELIZABETH BEALE RIPPLE IN THE POND AWARD was established in 2001 by Mr. and Mrs. George G. Strong through the Strong Family Foundation to reward an undergraduate student in any area of the university for random acts of kindness. The award

was created to express the extreme gratitude of Mr. and Mrs. Strong in recognition of the assistance and care that their daughter, Meredith, received from her friends and the Vanderbilt community as she was stricken with meningococcal meningitis. Physicians credit the quick action taken by Meredith's classmates and Vanderbilt personnel with saving her life.

THE CHARLES FORREST ALEXANDER PRIZE IN JOURNALISM was endowed in 1982 by friends of Mr. Charles Forrest Alexander, B.A. 1950, who died in 1976. As a student, he was editor of the *Commodore, V Book*, and a staff member of the *Hustler*. The fund provides support for an annual prize to be awarded to a student who has achieved distinction in journalistic projects at Vanderbilt University.

THE GREG A. ANDREWS CIVIL ENGINEERING MEMORIAL AWARD was established in 1969 by James M. Andrews, Sr. to support a senior in civil engineering who, as judged by the faculty, has made the greatest progress in professional development and who plans to pursue graduate study in environmental and water resources engineering at the School of Engineering. Donor established the fund to honor the memory of his son, Greg, a junior at Vanderbilt who was fatally injured in an auto accident.

THE DAN BARGE JR. AWARD IN CIVIL ENGINEERING was established in 2011 by multiple donors as an award to give to a junior civil engineering student who exhibits outstanding academic performance and dedication to professional or community service at the School of Engineering. This fund was established to honor the legacy of Daniel B. Barge Jr., B.E. 1943, who was named a Distinguished Alumnus by the School of Engineering in 1981. Dan served his school in numerous capacities, both formal and informal: as an advisor, an employer of graduates, a donor, volunteer solicitor, and most importantly, as a role model for students. For many years, thanks to Dan's efforts, the school has presented an annual American Society of Civil Engineers (ASCE) Award, given in recent years as the ASCE/Dan Barge Award, to honor Dan's professional accomplishments and contributions to ASCE that culminated in his 1987 presidency.

THE MORRIS H. BERNSTEIN JR. PRIZE IN LATIN DECLAMATION was endowed in 1983 by Mr. William H. Bernstein, B.A. 1983, open to any undergraduate student who has completed at least two semesters of Latin at Vanderbilt University. Contestants shall deliver from memory selected Latin prose or poetry passages which reflect the classical ideal. The fund is named for Mr. Bernstein's father, Dr. Morris H. Bernstein, Jr., B.A. 1943, M.D. 1946.

THE GLENN AND ELIZABETH BOGITSH AWARD was established in 1989 by Burton J. Bogitsh, professor of biology, and Mr. and Mrs. James T. Norris, Jr., to provide an annual award to the student at Vanderbilt University who has best demonstrated a strong commitment to campus recreational programs and, by example and leadership, has inspired participation and sportsmanlike conduct in these activities. The award recognizes physical fitness, participation in recreational sports, and sportsmanship and was established to honor the memory of the Donors' son, Glen, and daughter, Libby, both Vanderbilt graduates who died in a 1988 plane crash. The award recipient will be given a small prize and will have his or her name engraved on a plaque, which describes the award and lists annual winners, to be mounted on a wall of the Student Recreation Center.

THE CASEY CARTER BONAR LEADERSHIP AWARD was established in 2011 by multiple donors to provide awards to undergraduate students in their senior year based on leadership, broad collaboration, enthusiasm, passion for campus involvement, selfless service to Vanderbilt, and dedication to positive change at Vanderbilt University. This fund was established to honor the memory of Casey Carter Bonar, B.A. 1985, a dedicated and selfless leader who inspired excellence and propelled others to join in her commitment to serve. Casey's vitality, warmth, compassion, and boundless enthusiasm served to energize and enhance each of the many campus activities in which she was involved, including student government, student media, Greek life, and Impact. Her passion for facilitating friendship and camaraderie for higher purpose, for promoting service to all and helping expand the horizons of the "underdog," earned her the lifelong gratitude and admiration of her Vanderbilt community. An active member of the Alumni Association Board, she often interviewed prospective students and organized alumni activities. Casey was proud of her Vanderbilt education. She

exemplified Cornelius Vanderbilt's vision of strengthening the ties that bind as she consistently reached out to make someone's life better.

THE MARGARET BRANSCOMB PRIZE was established in 1993 to support an undergraduate prize at the Blair School of Music. The wife of Vanderbilt's fourth Chancellor, Harvie Branscomb (1946–1963), Mrs. Branscomb served as president of the Vanderbilt Garden Club from 1952 to 1954. Historically, the prize is given annually to a Blair freshman judged by the faculty to have the musical and personal qualities that best exemplify the spirit and standards of the school.

THE SUE BREWER FUND SCHOLARSHIP was established in 1987 by the Songwriters Guild Foundation to provide support to either composition or guitar majors at the Blair School of Music. To qualify, an entering freshman must be ranked in the upper 25th percentile of his or her class, and an upperclassman must have maintained at least a 3.0 GPA in the performance area, a 2.5 GPA in music, and a 2.0 overall GPA. This fund was established in memory of Sue Brewer, who befriended many of Nashville's struggling songwriters in the late 1960s and early 1970s.

THE FRANKLIN BROOKS MEMORIAL AWARD was established in 1995 by multiple donors to defray travel costs for students studying in France through the Vanderbilt in France program at the College of Arts and Science. This fund was established in memory of H. Franklin Brooks, former associate professor of French and three-time director of the Vanderbilt in France program during his 25-year teaching career at Vanderbilt.

THE LARRY ROSS CATHEY AWARD was established in 1974 by Arnold M. Heiser to support an award that will recognize the most outstanding student majoring in astronomy in the Astronomy Department at the College of Arts and Science. This award was established in 1974 in memory of Larry Ross Cathey, who graduated in 1966 with honors in physics and astronomy.

THE NORA C. CHAFFIN SCHOLARSHIP was established 1956 by the Women's Council of the Women's Student Government Association to provide scholarship support for deserving undergraduate students at Vanderbilt University. This fund was established in honor of Nora C. Chaffin, former Dean of Women known for her service and loyalty to Vanderbilt University and its women students. The scholarship is awarded to a junior student who has displayed service to the University in the area of student government, religious, literary and scholastic activities, and in the arts.

THE CLASSICS DEPARTMENT STUDENT TRAVEL FUND FOR ROME, ITALY was established in 2006 by Richard H. Davis, B.E. 1969, and Barbara C. Davis, B.S.N. 1969, to support undergraduate student travel expenses in Rome, Italy, through the Classics Department at the College of Arts and Science.

THE PAUL CONKIN FUND was established in 1999 by an anonymous donor to establish a prize for the best undergraduate term paper written on American History in the History Department at the College of Arts and Science. Paul Conkin, Distinguished Professor of History Emeritus at Vanderbilt University, is the author of the history of Vanderbilt University, *Gone with the Ivy*, and the *Peabody College History* which was published in 2002.

THE COOLEY PRIZE was established in 1920 to provide recognition for students who excel in fine arts at the College of Arts and Science. The prize is named after Comrade Theodore Cooley, known as one of the most public-spirited citizens of Nashville. Cooley was a successful Nashville businessman and supporter of the Tennessee Centennial and International Exposition held in Nashville in 1897 at the current location of Centennial Park on West End Avenue.

THE WALTER CRILEY PRIZE PAPER AWARD was established in 1978 by Robert Derrick, B.E. 1954, and the Simons-Eastern Company to be given for the best paper on an advanced senior project in electrical engineering at the School of Engineering at Vanderbilt University. This award was created in honor of Walter Criley, professor emeritus of electrical engineering, who taught from 1947 until his retirement in 1965. Professor Criley helped organize both the student chapter and the Nashville section of the Institute of Electrical Engineers, and also served as southeastern regional vice-president of the National Institute of Electrical Engineers. He passed away in 1977.



THE EDWARD PRENTICE DAVIS MEMORIAL PRIZE was established in 1997 by classmates of Mr. Edward 'Ward' Prentice Davis, B.A. 1987, to provide support for an annual prize awarded to a deserving NROTC college program midshipman. Ward was commissioned as a Second Lieutenant in the United States Marine Corps and served honorably for three years as an artillery officer. To his Marine Corps peers, Ward was an inspiration because he pursued his commission as a college program midshipman, without any scholarship. Ward passed away in 1995. This fund was established to honor Ward's commitment and perseverance.

THE ALLAN P. DELOACH MEMORIAL PRIZE IN PHOTOGRAPHY was established in 1998 by Mr. Rusty Edmister and Mrs. Pat Adams to support a prize in photography in the Fine Arts Department at the College of Arts and Science. This fund was established in memory of Mr. Edmister's and Mrs. Adam's former co-worker at IBM and Vanderbilt University alumnus, Allan P. DeLoach, B.A. 1963. The award is open to any student who has taken a studio class of any discipline. Students will submit one to three photographs to be judged by a professional photographer, outside of the Vanderbilt community, who will pick the winner and give a slide lecture to students on his/her work.

THE ROBERT V. DILTS AWARD was established in 1994 by multiple donors to provide an award to a deserving undergraduate chemistry student in the Department of Chemistry at the College of Arts and Science. This award was established to honor Professor Robert V. Dilts, who served on the chemistry faculty from 1960 to 1994.

THE ARTHUR J. DYER JR. MEMORIAL PRIZE was established in 1938 by Arthur J. Dyer, Sr. to award a medal to the Civil Engineering student in his/her senior year who shows the greatest proficiency in the study and/or design in the use of structural steel at the School of Engineering, and who is a student member of the American Society of Civil Engineers. This fund was established in memory of a former Vanderbilt student, Arthur James Dyer, Jr., who was injured while prosecuting engineering duties on a bridge at Panama City, Florida, and died September 2, 1928.

THE T. ALDRICH FINEGAN AWARD FOR EXCELLENCE IN UNDERGRADUATE ECONOMIC RESEARCH was established in 2005 by T. Aldrich Finegan, Professor Emeritus, to recognize excellence in undergraduate research conducted by a senior graduating from the economics honors program. The award should be given for an outstanding thesis written by a student in the Department of Economics Honors Program at the College of Arts and Science.

THE EDWIN S. GARDNER MEMORIAL PRIZE FOR EXCELLENCE IN FRENCH was established in 1980 by Grace D. Gardner, B.A. 1932, to be used, at the discretion of the Department of French at the College of Arts and Science, in one of two ways: 1) to fund an annual award to a graduating senior excelling in French studies, or 2) to purchase books for the French collection in Jean and Alexander Heard Library. Donor made this gift in honor of her late husband, Edwin S. Gardner, B.A. 1927, who served as treasurer of Vanderbilt from 1953 to 1971.

THE GEYER AWARD was established in 1979 by Mr. Richard A. Geyer Jr. to support a competitive journalism award designed to give recognition to campus reporters "who consistently write articles resulting from thorough research" and whose articles are, at the same time, "lively, informative, and logical" in any area of Vanderbilt University.

THE GUY GOFFE MEANS AWARD was established in 1975 through the bequest of Marie Hochle Means to provide an award to a student with ability in creative writing in the Department of English at the College of Arts and Science.

THE NORMAN L. AND ROSELEA J. GOLDBERG PRIZE was established in 1988 by Roselea J. Goldberg to support an annual award for the best manuscript submitted each year to Vanderbilt University, preferably in the area of art and medicine. The manuscript will be judged by a committee from Vanderbilt University Press.

THE JOHN P. GREER AWARD was established in 2006 by Professor John and Mrs. Shirley Lachs to provide an award to graduating seniors majoring in philosophy and going to medical school. Donors established this award in honor of Dr. John P. Greer, Professor of Medicine in Vanderbilt's

Department of Hematology, to commend his career path and in gratitude of the care given by Dr. Greer to Mrs. Lachs.

THE LARRY C. HALL STUDENT TRAVEL FUND was established in 1995 by multiple donors to support a student traveling to the Pittcon Conference, a chemistry related conference, through the College of Arts and Science. The fund was established in honor of Dr. Larry Hall at the time of his retirement.

THE MARGARET STONEWALL WOOLDRIDGE HAMBLET FELLOWSHIP was established in 1985 by Clement H. Hamblet and Margaret Hamblet Sarner at the College of Arts and Science. The fellowship was established in memory of Margaret Hamblet's love of art and travels to Europe to study art. Margaret Hamblet was a graduate of Peabody College in the Class of 1926. Clement and Margaret Hamblet met in Paris where Margaret was an art student. The fellowship is awarded to a deserving senior with outstanding merit in art and completion of three or more studio art courses and provides one year of travel and furtherance of creative endeavor following graduation from the College of Arts and Science. The second priority for the fund is to provide a continued small subsidy for a second graduating senior. As per a letter from interim dean Carolyn Dever to Margaret Hamblet Sarner in July 2008, an additional usage of the fund was requested given the Margaret Stonewall Wooldridge Hamblet Award was generating more than was being used to support the two students who receive it. It was requested that the additional/excess funds be utilized to create a "Hamblet experience" for advanced undergraduate students. This is to be done in the spirit of the Hamblet award and is to involve such things as speakers and exhibits to enhance both the undergraduate experience as well as the quality of applicants for the Hamblet Award. This third priority for the fund should be pursued only if funds allow.

THE JEAN AND ALEXANDER HEARD AWARD was established in 2013 by the children of Jean and Alexander Heard to provide need-based financial assistance to deserving undergraduate students who have been accepted to one of the summer music festivals through a summer study program at the Blair School of Music. This fund was established in memory of Jean and Alexander Heard. Chancellor Alexander Heard served as Vanderbilt University's fifth Chancellor from 1963 to 1982 and oversaw many changes in the campus. Under his tenure, Peabody College, Blair School of Music, and Owen School of Management became part of the University.

THE JEAN KELLER HEARD PRIZE was established in 1985 by the Vanderbilt Woman's Club to provide an award for excellence in music performance to a string student seeking a Bachelor of Music degree at the Blair School of Music. This fund was established to honor violinist Jean Keller Heard, the wife of Vanderbilt's former Chancellor Alexander Heard. Mrs. Heard passed away in 2011.

THE HISTORY DEPARTMENT FRESHMAN SEMINAR AWARD was established in 2001 by Professor Sam McSeveney to award an annual prize of \$100 to the student who has completed the best freshman paper in a history freshman seminar at the College of Arts and Science. Upon Professor McSeveney's death, he wishes for the award to bear his name.

THE FRANK HOUSTON AWARD FOR ORATORY was established in 1974 by Mr. Frank K. Houston, B.A. 1904, and former member of the Vanderbilt Board of Trust, to support an award for an annual prize given to a student who excels in a presentation in public speaking in any department at Vanderbilt University. Mr. Houston grew up in Murfreesboro, Tennessee, and took public speaking while he was a student at Vanderbilt. He established this competition to encourage competent public speaking, as he believed that his experience at Vanderbilt had made a very real difference in his own life.

THE MELVIN D. JOESTEN SCIENCE VOLUNTEER AWARD FUND was established in 1998 by multiple donors to provide an award for outstanding science student volunteers in the Chemistry Department at the College of Arts and Science. This endowed fund was established in the name of Melvin "Mel" D. Joesten in recognition of his many years of service to the department and to Vanderbilt University.

THE MARK M. JONES UNDERGRADUATE AWARD IN INORGANIC CHEMISTRY was established in 1998 by colleagues and other friends

of Professor Jones to recognize undergraduates who have excelled in inorganic chemistry at the College of Arts and Science. Preference will be given to students showing excellence in undergraduate research. Dr. Jones taught chemistry from 1957 until his retirement in 1998 and chaired the chemistry department from 1970 until 1976.

THE MICHAEL B. KEEGAN TRAVELING FELLOWSHIP was established in 2004 by Michael B. Keegan and others to provide one or more graduating undergraduate student(s) with an opportunity to study and travel abroad in pursuit of an issue or topic of personal and intellectual passion. The Fellowship will provide a minimum of one annual award, each in the amount of not less than \$10,000 to help pay for travel expenses for the recipient(s), allowing the recipient(s) to study and possibly work outside the United States of America for approximately one year. The fund was established as an international fellowship to foster in the student(s) a sense of his/her potential as a citizen of the world, and as a traveling fellowship to create a deep cross-cultural experience.

THE W. G. KIRKPATRICK PRIZE was established in 1926 through a bequest from Walter Gill Kirkpatrick, B.E. 1887, B.S. and M.S. 1889, to provide support for an annual prize for the most deserving third-year student in the Department of Civil Engineering at the School of Engineering.

THE R. J. LARSEN PRIZE FOR EXCELLENCE IN MATHEMATICS was established in 2005 by multiple donors to provide an award to a graduating senior for excellence in mathematics at the College of Arts and Science. This fund was established in honor of Professor Richard Larsen to celebrate his retirement. Professor Larsen worked at the Department of Mathematics in the College of Arts and Science for over thirty years.

THE C. MAXWELL LANCASTER MEDAL FOR EXCELLENCE IN ITALIAN was established in 1990 by Professor Luigi Monga to honor the memory of C. Maxwell Lancaster, Professor of French and Italian at Vanderbilt University from 1939 until his retirement in 1976, and to promote the study of the Italian language and literature at Vanderbilt University. The annual prize will consist of a medal which will be awarded on recommendation by the faculty of the Department of French and Italian to a fourth-semester student for excellence in Italian.

THE JOEL CARL LICHTER MEMORIAL AWARD was established in 1996 by Professor and Mrs. Barry D. Lichter to provide an award that will be presented each year at the Kudos/Magnolia Ceremony to a graduating senior who contributes by example to the promotion of outdoor education, combining academic excellence and expertise in wilderness skills along with friendship and service to others in any area of Vanderbilt University. Professor and Mrs. Lichter established the award to honor the life of their son Joel Lichter, an avid outdoorsman who graduated from Vanderbilt University magna cum laude in 1981 with honors in chemical engineering. Joel Lichter died in a 1992 accident in Alaska while commercial fishing.

THE LEE J. LOVENTHAL PRIZE was established in 1937 by Mr. Lee Jefferson Loventhal, class of 1896 and member of the Vanderbilt University Board of Trust from 1919 to 1940, to establish a prize in the Department of Public Speaking.

THE S. S. AND I. M. F. MARSDEN AWARD IN MUSICAL SCHOLARSHIP was established in 1998 by Dr. Sullivan F. Marsden for a written paper on a topic that might lie outside the normal core of scholarship at the Blair School of Music. The award will be an annual \$1,000 prize to encourage and recognize excellence in scholarship. Mr. Sullivan F. Marsden made additional contributions to create an endowed fund in 2005.

THE THOMAS W. MARTIN MEMORIAL AWARD was established in 1992 by multiple donors to support an award recognizing an outstanding undergraduate physical chemistry student at the College of Arts and Science. This fund was established in memory of Thomas W. Martin Jr., chair of the Department of Chemistry from 1967 to 1970.

THE JOHN T. AND LIZZE ALLEN MCGILL AWARD was established in 1960 by Mrs. John T. McGill to provide support for an award to one or more residents of McGill Hall who have the best developed qualities of leadership and scholarship. This fund was established in memory of Mrs. McGill's husband who passed away in 1946, and who spent his life in service to Vanderbilt as a student in the class of 1879, professor emeritus of

chemistry, Dean of the School of Pharmacy, and historian of the university. Preference in awarding is for need-based aid to a freshman.

THE MERRILL MOORE AWARD was established in 1961 by Mrs. Merrill Moore, Vanderbilt alumna and widow of the late Merrill Moore, M.D. 1928, to provide a cash award to a student graduating from Vanderbilt University or a junior or senior student on the basis of the student's literary promise and the psychological or practical usefulness of award to him/her at the College of Arts and Science. Dr. Moore was an internationally known Boston psychiatrist and a poet.

THE HENRIETTA HICKMAN MORGAN MEMORIAL PRIZE was established in 1946 by William B. Morgan II to provide awards to freshmen students with the best pieces of original writing at the College of Arts and Science. This fund was established in memory of the donor's wife, Henrietta Hickman Morgan. Mrs. Morgan received her B.A. in 1938 from Vanderbilt University and was a member of the Kappa Alpha Theta sorority, and Phi Beta Kappa Phi Sigma Iota, an honorary romance language group. She served as flag secretary and aide to Rear Admiral Martin K. Metcalf for more than two years before falling ill in 1945.

THE NED PARKER NABERS AWARD was established in 1984 by multiple donors to provide an annual prize for the best essay or research paper by an undergraduate student in the fields of classical archaeology or ancient art or architecture. The fund was established in memory of Ned Parker Nabers who served on faculty from 1966 until his death in 1984.

THE DANA W. NANCE PRIZE was established in 1985 by Professor Francis C. Nance, B.A. 1953, and family to provide an annual award to a student at the College of Arts and Science. The award will recognize an outstanding student from the pre-medical curriculum who has demonstrated perseverance in overcoming academic, financial, or social obstacles to succeed, who is well-trained in the technical skills acquired through the undergraduate pre-medical curriculum, and who possesses an abiding sense of ethical and moral concern for the patient. The fund was established to honor Dana W. Nance, B.A. 1925, M.D. 1929, who served for many years as the area chairman of the Vanderbilt Alumni Fund.

THE ELLIOTT AND AILSA NEWMAN CLARINET AWARD was established in 1999 through the bequest of Ailsa MacKay Newman along with additional memorial gifts to provide an award to a deserving clarinet student at the Blair School of Music. Preference when awarding is given to a clarinet major who shows strong musical promise. If a clarinet major is not available, the award should be given to a woodwind student. This fund is named for Mrs. Newman and her husband, who predeceased her.

THE L. HOWARD NICAR MEMORIAL FUND was established in 1997 by multiple donors to award a prize or scholarship to a collegiate student at the Blair School of Music. This fund was established in memory of L. Howard Nicar, former Assistant Dean of Admissions at the Blair School of Music.

THE DONALD E. PEARSON AWARD was established in 1980 by the Chemistry Department and endowed in 2008 by Dr. and Mrs. Frank Pinkerton to provide support for an annual award to an outstanding chemistry major who has done undergraduate research in chemistry. Professor Donald E. Pearson served as faculty in the Department of Chemistry at the College of Arts and Science until his retirement in 1986.

THE PHI BETA KAPPA CENTENNIAL AWARD was established in 1998 by the Phi Beta Kappa Council to provide support for an annual award at the College of Arts and Science. This fund, established in celebration of the Alpha of Tennessee chapter's centennial in 2001, will be presented to a Vanderbilt senior who has been elected to Phi Beta Kappa in their junior year and who has demonstrated excellence in several different fields of academic endeavor, and has applied his or her intellectual talents in extracurricular activities within the university or community that exemplify a dedication to improve the human condition.

THE EMILY ANN BENNETT PLANT AWARD IN ANTHROPOLOGY was established in 1995 by Emily Ann Bennett Plant, B.A. 1994, to provide financial support based on merit and need to recognize excellence in the study of anthropology at the College of Arts and Science. The award may be applied to the cost of tuition and living expenses or to fund supplemental educational activities that will enrich the study of anthropology, such as summer research or participation in a field school.

THE ROBERT PETER PRATT MEMORIAL AWARD was established in 1991 by multiple donors to honor Robert Peter Pratt (1954–1991), former associate director of Undergraduate Admissions and longtime leader in promoting diversity within the student population. The award is presented annually to the Chancellor's Scholar whose accomplishments best exemplify Peter Pratt's commitment to diversity and unity, leadership and cooperation, warmth and openness, and unselfish service to others. The award recognizes a Chancellor's Scholar of junior or senior standing whose campus leadership and service promote diversity and enhance understanding among the various groups that comprise the university community. Academic performance is also considered in selecting the award recipient.

THE DAVID RABIN PRIZE was established in 1985 by multiple donors to provide an annual prize to a student chosen on the basis of music ability and talent at the Blair School of Music. This prize was established in memory of Dr. David Rabin, former professor of medicine in obstetrics and gynecology at the School of Medicine. Dr. Rabin passed away in 1984.

THE JIM ROBINS AWARD was established in 1969 by Michael G. Wagner, B.A. 1957, to honor the memory of James A. Robins, class of 1892, whose life and teaching exemplified selfless devotion to learning, to honor, to participate in sports and to service to youth and Vanderbilt. The prize is awarded to a member of the football team voted as the most outstanding representative of the group.

THE JOE L. ROBY NROTC ESPRIT DE CORPS AWARD was established in 2006 by Mr. Duff Anderson and Mr. W. Patrick McMullan III, B.A. 1974, to recognize and reward Vanderbilt NROTC Midshipmen who display outstanding enthusiasm and esprit de corp as members of the battalion through involvement in NROTC and university activities and provide inspiration to fellow midshipmen and students at Vanderbilt University. The award was created in honor of Joe L. Roby, B.A. 1961, Vanderbilt trustee emeritus, and a former Battalion Commanding Officer of the Vanderbilt NROTC Midshipmen Battalion in recognition of his inspiring leadership at Vanderbilt University and with the Vanderbilt Naval ROTC program and his subsequent service in the United States Navy. He was also a member of the Shape the Future Campaign Steering Committee and was the former chairman of the College of Arts and Science Shape the Future Campaign Committee.

THE KATHRYN SEDBERRY POETRY PRIZE was established in 2003 through the estate of Kathryn Sedberry, M.A. 1963, to provide support for an annual \$2,000 poetry prize in the Department of English at the College of Arts and Science.

THE JAMES G. STAHLMAN NROTC AWARD was established in 1972 by former Vanderbilt Trustee, James Geddes Stahlman, B.A. 1919, to provide an award to the top Navy ROTC member and the top Marine ROTC member from the senior class who have proven themselves to be the most outstanding in citizenship, scholarship, and leadership in the Naval ROTC unit. The award recipients will be chosen by their Commanding Officer.

THE DAVID STEINE ECONOMICS AND BUSINESS AWARD was established in 2006 by James B. Johnson Jr., B.A. 1954, to recognize undergraduates for excellence in the Corporate Strategy competition in the Managerial Studies Program in the College of Arts and Science. The award was established to honor the memory and distinguished career of David Stein, a professor held in the highest esteem by the donor.

THE STEIN STONE MEMORIAL AWARD was established in 1948 by Mrs. James N. Stone to provide an award to students in the School of Engineering. This fund is to be awarded to a graduating senior who has lettered in a sport, preferably football, and who is judged to have made the most satisfactory scholastic and extramural progress as an undergraduate. This fund was established in memory of Mrs. Stone's late husband, James "Stein" N. Stone, student at the School of Engineering in 1908 and an "All Southern" center on the Vanderbilt University football team from 1904 to 1907.

THE HENRY LEE SWINT AWARD was established in 1976 by Frank A. Woods, B.A. 1963, LL.B. 1966, for an undergraduate history major with the best history essay or research paper in the Department of History at the College of Arts and Science. The fund was established in honor of Henry Lee Swint, a former Holland N. McTyeire Professor of History who served on the faculty from 1939 until his retirement in 1977.

THE ROBERT D. TANNER UNDERGRADUATE RESEARCH AWARD was established in 2005 by multiple donors to provide an award to an undergraduate student conducting research in the Department of Chemical Engineering at the School of Engineering. This award was established in honor of Dr. Robert D. Tanner, emeritus faculty, at the time of his retirement. Dr. Tanner was a professor of chemical engineering at Vanderbilt University.

THE JOEL TELLINGHUISEN PHI BETA KAPPA AWARD was established in 2006 by James B. Johnson, Jr., B.A. 1954, to recognize undergraduate students who have been initiated into Phi Beta Kappa and have shown exceptional ability in the College of Arts and Science. The award honors Joel Tellinghuisen, Professor of Chemistry, for his positive impact and influence in educating undergraduate students at Vanderbilt, including Mr. Johnson's daughter, Katherine Johnson, B.S. 1994, M.Ed. 1995. The annual awards will be made to graduating seniors who are members of Phi Beta Kappa, in recognition of outstanding performance in research as an undergraduate at Vanderbilt.

THE UNDERWOOD MEMORIAL AWARD was established in 1961 by Newton Underwood to support a senior in the Department of Physics or Department of Biology selected alternately by the head of the physics department and the head of the biology department to be awarded each year at Commencement. The award honors his father, Judge Emory Marvin Underwood, A 1900, L 1902, and a member of the Vanderbilt Board of Trust from 1922 until his death in 1960, who devoted his life to justice and to bringing out the best in people.

THE JACQUELINE AND MORRIS WACHS ESSAY PRIZE was established in 1999 by multiple donors to support a prize in the Department of French and Italian at the College of Arts and Science. This fund was established in memory of Jacqueline Wachs, former French professor from 1966 until her retirement in 1994, and Morris Wachs, emeritus professor of French at Vanderbilt. Mrs. Wachs died in 1999 and Mr. Wachs died in 2001.

THE WALTHER AWARD FOR VUCEPT EXCELLENCE (WAVE) was established in 2005 by Beverly R. Walther and Michael C. Walther II to reward the outstanding service of undergraduates participating in the VUcept program at Vanderbilt University. It is awarded to students based on criteria set out by the Office of New Student and Family Programs and the donors.

THE THOMAS M. WESER AWARD was established in 1989 by multiple donors to provide support for an annual award honoring an international student who has demonstrated an exceptional commitment to intellectual life, cross-cultural appreciation, and personal integrity at Vanderbilt University. Weser Award recipients are typically active in student organizations and community service projects outside of the classroom and maintain a solid record of academic performance at the undergraduate or graduate level. This fund was established in memory of Thomas M. Weser, an exchange student from Germany who was killed while attending Vanderbilt University in 1988.

THE MARTIN WILLIAMS AWARD was established in 1992 by multiple donors to provide an award to a music major writing the most outstanding paper for a music theory or literature/history course at the Blair School of Music. This fund was established in memory of Martin Williams, Director of the Smithsonian Institution's Jazz Program and Adjunct Professor of Jazz History at the Blair School of Music.

THE KATHERINE B. WOODWARD PRIZE IN SPANISH was established in 1943 by Katherine B. Woodward, B.A. 1919, to provide an award to the student with the highest average majoring in Spanish at the College of Arts and Science. Preference in awarding will be given to senior year students. Miss Woodward served as a teacher then head of the Spanish Department at the Woodrow Wilson High School in Portsmouth, Virginia, from 1919 until her retirement in 1956. She had a deep love for Vanderbilt and an intense interest in promoting the teaching of Spanish.



# College of Arts and Science

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# A Community for Liberal Learning

“The work of the College of Arts and Science is fundamental. It is the basis of all professional study. No professional school can be self-sufficient. The College in its undergraduate and graduate work must remain the heart of the whole situation, and send its quickening life blood into every fiber and tissue.”

—Chancellor James H. Kirkland  
at the semicentennial celebration of the university  
October 1925

CHANCELLOR Kirkland’s words were prophetic of our times as well as true of his own. Since its founding Vanderbilt has pursued its mission of excellence in the liberal arts with a commitment to liberal learning that is the special concern of the College of Arts and Science. Liberal learning endures because it brings men and women to subjects, concepts, and modes of thought that enable them to think critically about where humanity has been and where it ought to be going. The liberal arts spark curiosity and broaden vision, help to instill understanding of matters otherwise unknown, and encourage individuals to live their lives with a sense of purpose, context, and relatedness. A liberal education has perennial relevance and usefulness: it should prepare its recipients to think precisely, to reason clearly, and to judge wisely—all practical considerations in the pursuit of constructive and satisfying lives and in the practice of today’s professions and vocations.

Today the College of Arts and Science maintains its historic position as the heart of the university. Excellence in undergraduate and graduate education is its unwavering aim.

The College of Arts and Science provides intellectual stimulation, training, and incentive designed to foster the lifelong liberal learning of its graduates. It offers challenging, forward-looking programs of study in the humanities, natural sciences, and social sciences resourcefully taught by distinguished faculty recognized for excellence in research, scholarship, and creative expression. It promotes self-realization and expression in the context of social responsibility.

## Faculty and Students

The College of Arts and Science derives its strength from the range of its academic offerings, from the quality of the faculty who teach, and from the quality of the students who come to learn. Traditionally fortunate in its ability to attract and retain a superior faculty, the College of Arts and Science has about 400 full-time professors who supplement their achievements in the classroom with significant research, creativity, and writing. Many faculty members hold awards for distinguished scholarship and have been elected to high offices in their professional associations, including the Classical Association of the Middle West and South, the American Economics Association, the American Political Science Association, the American Philosophical Association, the American Physical Society, the American Historical Association, and the Biophysical Society.

The quality of the College’s faculty is matched by that of its diverse student body. Undergraduates come from the fifty states and fifteen to twenty foreign countries and are almost evenly divided between men and women.

## Academic Support

### The Writing Studio / Arts and Science Tutoring

The Writing Studio provides undergraduate students the opportunity to meet with trained writing consultants to discuss individual writing concerns, from invention to drafting to revision. The Writing Studio provides a space for students to discuss work-in-progress with expert writers, to create their own writing, and to utilize available resources for improving both writing and critical thinking skills.

The mission of the Vanderbilt Writing Studio is to enhance student writing and writing instruction, and to encourage regular conversation about the writing process. The Writing Studio’s extensive programming includes individual consultations, workshops, creative writing groups, workshops focused on specific issues in academic writing, open-mike readings, and student-run writers’ support groups.

The Writing Studio is located at 1801 Edgehill Avenue, Suite 112, and there is a satellite location in 217 Commons Center convenient to the first-year residence halls. The Writing Studio website can be accessed at [vanderbilt.edu/writing](http://vanderbilt.edu/writing).

One-on-one tutoring in many subjects is available through Tutoring Services, also located at 1801 Edgehill Avenue. Consultations in the Writing Studio and in Tutoring Services are free to all undergraduates.

### Computers

The following locations are available for walk-in use of computers and software:

- Center for Second Language Studies (Furman Hall 001) — 2 Macintosh and 2 Windows systems, 12 iPads, and 10 digital recorders for student use in the center
- Garland lab and computer classroom (Garland Hall 119) — 24-seat lab/30-seat classroom with 50 Windows and 4 iMac systems
- Stevenson computer lab and lounge (Stevenson Center 2200) — 33 Windows systems
- Wilson computer lab (Wilson Hall 120) — 30 iMac systems

All of the college’s computer labs and classrooms offer a wide variety of “courseware” and commercial “productivity software,” including word processing packages. Color printing and scanners are available in most of the labs. In addition to accessing software on the local servers, students may also connect to both campus services and the internet, including VUGmail and e-resources in the libraries, as well as course materials in Blackboard. While use of the above facilities is free, printing is charged at a rate of four cents per page.

The Garland and Wilson labs are open six days a week, with the Garland lab available for walk-in use for more than ninety hours per week. The computer classrooms in the Center for Second Language Studies and Wilson Hall are available for walk-in use during the late afternoon and evening hours. Stevenson Center lab and lounge are card-accessible seven days a week, 6:00 a.m. to 1:00 a.m. All lab hours are posted by semester at [as.vanderbilt.edu/vuit/computer\\_services/facilities/Labs.php](http://as.vanderbilt.edu/vuit/computer_services/facilities/Labs.php). In addition to the college facilities, a few “kiosk” systems are

available in the Sarratt Student Center. As a result, access to computers in the College of Arts and Science is extensive.

At last count, more than 98 percent of Vanderbilt students own a personal computer. Since all students also have a high-speed network connection, it is convenient for students to have their own system (please consult the ResNet guidelines for supported systems). However, most students will find that the college computing facilities provide all of the computing resources that are needed for success at Vanderbilt.

## The Advising System

Entering first-year students are assigned faculty advisers from CASPAR (College of Arts and Science Pre-major Academic Advising Resources Center). These first advisers, called “pre-major faculty advisers,” counsel students during their first three and one-half semesters, or until the students choose majors, when they are assigned faculty advisers in their major department or program. Pre-major faculty advisers are especially trained to help students move efficiently through the requirements of AXLE (Achieving Excellence in Liberal Education) and chart a course of study.

During the last two years of study, when a student is acquiring depth of knowledge in a major field, studies are guided by a specialist in that field. Students are encouraged to see their faculty advisers at any time, since the advisers are available for guidance and counseling and are faculty members with whom advisees may be studying.

All students are required to see their faculty advisers prior to registration for each semester.

Advisers are generally happy to talk over any problems students may have, although their chief function is academic counseling. In addition, several members of the Office of the Associate Deans of the College, themselves teaching faculty members, have as their principal duty counseling students and referring them to sources of expertise on non-academic problems.

## Public Lectures

**THE BERRY LECTURES.** Established in 1988 through the generosity of Kendall and Allen Berry, John and Shirley Lachs, Steve Turner, and Jim Burke. Three annual lectures—the Berry lecture, the Steve Turner lecture, and the Jim Burke lecture—are given by distinguished philosophers.

**THE LOUIS JACOB BIRCHER LECTURE IN CHEMISTRY.** Established in 1976 in recognition of Professor Bircher’s forty-one years of service to Vanderbilt beginning in 1921. He served as the sole professor of physical chemistry until 1954, was chair of the Department of Chemistry from 1955 to 1961, and retired as professor emeritus in 1962. Family, colleagues, students, and friends of Professor Bircher have provided generous support for the series. The lecture is presented by a leading physical chemist.

**THE BYRN HISTORY LECTURE.** Established in 1986 and endowed by the late J. W. Byrn of Dickson, Tennessee, a student and admirer of the thought of the British historian Arnold Toynbee. Annual lectures deal with his fields of interest: world history, philosophy of history, and historiography.

**THE FREDERICK LEROY CONOVER MEMORIAL LECTURE.** First given in 1977 in honor of Vanderbilt’s first analytical chemist. Professor Conover came to Vanderbilt in 1923 and remained for thirty-seven years. Lectures given by a distinguished analytical chemist are supported by family, colleagues, students, and friends of Professor Conover.

**THE WALTER CLYDE CURRY SHAKESPEARE LECTURE.** Inaugurated in 1982 and funded by one of his former students, this lectureship honors the

late Walter Clyde Curry, distinguished medieval and Renaissance scholar, author of books on Chaucer, Shakespeare, and Milton, and for forty years beloved professor of English at Vanderbilt. Bringing to campus in alternate years eminent Shakespearean scholars and experienced Shakespearean performers, the lectureship gratefully recognizes Professor Curry’s devoted service and lasting contributions to the university.

**THE WAITE PHILIP FISHEL LECTURE.** Established in 1974 as a tribute to Professor Fishel, who was known as an outstanding, popular teacher and was renowned for his research in metallurgy. Through the generosity of family, colleagues, students, and friends, the lecture is presented by a leading inorganic chemist.

**THE HARRY C. HOWARD JR. LECTURESHIP.** Established in 1994 at the Robert Penn Warren Center for the Humanities in honor of Harry C. Howard Jr. (B.A. 1951). The lectureship was endowed by Mr. and Mrs. Thomas Nash Jr. and Mr. and Mrs. George Renfro, all of Asheville, North Carolina, in honor of their longtime friend and attorney. The lectureship allows the Warren Center to bring an outstanding scholar to Vanderbilt annually to deliver a lecture on a significant topic in the humanities.

**THE ARTHUR WILLIAM INGERSOLL MEMORIAL LECTURE.** Established in 1973 to honor Arthur Ingersoll, professor of organic chemistry at Vanderbilt until his death in 1969. Each year contributions for this lecture are received from family, colleagues, students, and friends. A leading organic chemist is invited to present the lecture.

**THE CARL K. SEYFERT LECTURE IN ASTRONOMY.** Established in 1983 as part of the astronomy program’s commemoration of the thirtieth anniversary of the Arthur J. Dyer Observatory. The lectureship recognizes the untiring efforts and contributions to astronomy made by Carl K. Seyfert, professor of astronomy and first director of the Dyer Observatory. A distinguished astronomer is invited to present this lecture every third year.

**THE SHANKS LECTURES.** Established in 1984 and named for E. Baylis Shanks and Olivia H. Shanks in honor of their accomplishments in the fields of mathematics and education and in recognition of their loyalty and service to Vanderbilt University, these lectures are presented on two successive days in the fall of each year. A special committee from the Department of Mathematics, influenced by the professional interests of Professor and Mrs. Shanks, chooses the lecturers from mathematicians of the highest reputation. The topics of the lectureship vary from year to year according to the area of specialization of the speaker chosen. The lectures have been endowed by members of the family of Olivia and Baylis Shanks.

**THE FRANCIS G. SLACK LECTURES IN PHYSICS.** Established in 1977 by the Department of Physics and Astronomy in honor of Francis G. Slack, former Landon C. Garland professor of physics and chair of the department, these lectures recognize his many contributions to physics. The series was first partially endowed by his colleagues and students and then with the generous help of Professor Slack. Each speaker gives one lecture of general interest to the university and one more specialized lecture for the department.

**THE DAVID STEINE LECTURE.** Established in 1978 as a memorial to David Steine, professor of business administration in the Department of Economics and Business Administration, by members of his family, friends, and associates. The lecture is devoted to an economic problem of interest to the general public.

**THE GERTRUDE VANDERBILT AND HAROLD S. VANDERBILT VISITING WRITERS PROGRAM.** Established in the Department of English in 1958 under the generous sponsorship of the late Mrs. Vanderbilt, this program has annually presented readings and public lectures by a poet, a novelist, and a critic—each of whom also visits classes and meets informally with members of the university and Nashville communities. Recent participants have included Dannie Abse, Madison Smartt Bell, Ellen Gilchrist, Alison Lurie, Czeslaw Milosz, Wyatt Prunty, Ann Thwaite, Anthony Thwaite, and Helen Vendler.

# Degree Program in the College

## The Bachelor of Arts

The bachelor of arts degree is granted upon successful completion of the following five requirements:

1. At least 120 semester hours of creditable college work,
2. A final grade point average of at least 2.000,
3. Completion of the AXLE requirements,
4. Completion of one of the options listed under Area of Concentration,
5. Completion of at least 102 credit hours of course work within the College of Arts and Science, or a minimum of 90 credit hours for those students with a second major outside the College of Arts and Science.

## Limitation on Credit Hours outside the College

Candidates for the bachelor of arts degree must successfully complete a minimum of 102 credit hours within the College of Arts and Science. Students who are completing an approved second major from one of the other schools within Vanderbilt are required to complete 90 credit hours within the College of Arts and Science for the bachelor of arts degree.

## AXLE: Achieving Excellence in Liberal Education

The Arts and Science core program of study—known as AXLE—is anchored in intensive practice in writing and a diverse thirteen-course component of classes that has been designed to allow maximum choice in course selection (based on student interests and achievement levels). At the same time, the distribution requirements of AXLE ensure that students will explore intellectually and academically the breadth of possibilities represented by the liberal arts.

## What Is Liberal Education?

The study of the liberal arts—what is historically called a liberal education—is the oldest and most venerable form of higher education. It has proved itself perennially flexible and adaptive over the past centuries, and it remains the single best educational preparation for further, specialized study in the professions (medicine, law, education, business, et al.), as well as for doctoral work in the humanities and social sciences and advanced research in the sciences. The holistic focus of a liberal education encompasses all areas of human knowledge: the natural and social sciences, mathematics, foreign languages and cultures, the arts, and the humanities. The empirical disciplines guide us in our efforts to live most productively and efficiently. But the rest of the curriculum—the humanities and the arts—makes it possible to reflect upon the right use of the remarkable scientific knowledge we have acquired. In a liberal arts education, content is always considered in its larger context. Thus, the reflective and discursive aspects of study in the liberal arts call upon students to move beyond the mere acquisition of information to inquire into the deeper issues within their studies, and

to connect their learning across disciplines and cultures as they live and work in the communal environment of Vanderbilt. The end product of a successful liberal arts education is a thoughtful citizen who is prepared to take up his or her rights and responsibilities in a democratic society, to analyze and critique received information, to articulate the issues at hand or the personal values at stake, and whose intellectual life is marked by ongoing internal dialogue about the quality and meaning of life for him or her, as well as for the community at large.

## Fear No Learning!

The interdisciplinary inclination of many courses in the College of Arts and Science is an ideal training ground for learning new methodologies for problem solving in the complex, global world of the 21st century. Here, students may work with biologists and psychologists in the Neuroscience program; study with creative writers, sociologists, historians, or cinema and media arts scholars in the African American and Diaspora Studies program; or take a class, team taught, by professors from the School of Music and the Department of English in the College of Arts and Science. Over the course of a Vanderbilt education, students challenge themselves with the academic demands of the classes they select, and are challenged by new ideas and unfamiliar ways of looking at issues. Exploring beyond the boundaries of one's intellectual comfort zone in order to admit new ideas is one of the most important aspects of higher education. The time and effort devoted to selecting thoughtfully the courses that will satisfy AXLE requirements prepare students for the more specialized study that they undertake in their major (or majors) beginning in the third year of study.

## What Is AXLE?

AXLE is the acronym for Achieving Excellence in Liberal Education. It is the core curriculum that all students in the College of Arts and Science must fulfill. The AXLE curriculum is flexible and very user-friendly. It consists of two parts: the Writing Requirement and the Liberal Arts Requirement.

The Writing Requirement has four segments: completion of English 1100 or demonstration (by a combined score of 1220 on the Writing and Critical Reasoning sections of the SAT test with a minimum score of 500 in each, or a score of 27 on the English portion combined with a score of 7 on the Writing portion of the ACT test, or by appropriate AP or IB credit in English) of basic skills in English Composition; completion of a First-Year Writing Seminar; completion of a 1000-level (introductory) writing course no later than the fourth semester in residence; and completion of a second 1000-level writing course OR a 2000, 3000, or 4000-level (discipline-specific, major-oriented) writing course OR a course in oral communication.

The Liberal Arts Requirement is composed of a total of thirteen courses taken at Vanderbilt, and distributed across six categories. The First-Year Writing Seminar and all writing courses, and approved Oral Communication courses are also counted in the thirteen-course Liberal Arts Requirement.



1. The Writing Requirement (three to four courses)
  - a. English Composition (appropriate test score or one course)
  - b. First-Year Writing Seminar (one course)
  - c. 1000-level W Requirement (one course)
  - d. One 1000-level W or 2000, 3000, or 4000-level W or approved Oral Communication course
2. The Liberal Arts Requirement (13 courses)
  - a. HCA — Humanities and the Creative Arts (three courses)
  - b. INT — International Cultures (three courses)
  - c. US — History and Culture of the United States (one course)
  - d. MNS — Mathematics and Natural Sciences (three courses)
  - e. SBS — Social and Behavioral Sciences (two courses)
  - f. P — Perspectives (one course)

All students must also complete requirements for at least one major (between 27 and 48 credit hours of course work) and earn a minimum number of 120 earned credit hours in order to graduate.

### How to Get Started

The program of studies is divided approximately into thirds:

- 1/3 — courses to meet the requirements of the Writing and Liberal Arts requirements;
- 1/3 — courses required to complete the chosen major;
- 1/3 — electives, which will complete the 120 credit hours required for graduation.

These divisions are approximate and may differ for individual students.

For a student's first semester, most selections should be from the first group, courses that will fulfill the Writing and Liberal Arts requirements. Academic background, career goals, and general talents and interests will affect choice of courses.

Upon graduation, students in the College of Arts and Science will receive a bachelor of arts degree upon completion of the other four requirements in addition to AXLE: fulfillment of requirements for one major, a 2.000 average in the major, 120 cumulative earned credit hours, and a 2.000 average overall.

### Where to Get Information

In addition to this catalog's sections on the rules, regulations, and policies of the College of Arts and Science as well as descriptions of the academic programs of all the undergraduate schools, students may refer to the booklet, *On the Road with AXLE*, a College of Arts and Science manual for entering students.

### Where to Get Advice

Entering students are assigned pre-major faculty advisers from CASPAR (College of Arts and Science Pre-major Academic Advising Resources). Pre-major faculty advisers are carefully selected and receive intensive training on how to help students proceed effectively through the requirements of AXLE and chart a course of study. These advisers will counsel students through their first three and a half semesters or until they declare a major. At that time, students are assigned faculty

advisers in their major departments. Students are encouraged to see their advisers at any time; they must, however, consult their pre-major faculty adviser three times during the first year: during summer before the fall semester, prior to the opening of enrollment windows for the spring semester, and prior to the opening of enrollment windows for the fall semester of their second year. Prior to their first semester, entering first-year students must consult in June with their pre-major faculty adviser who will assist with course selections for registration for the fall and begin to understand each student's interests and goals. (This initial contact is typically via phone and/or email.)

### Overview of AXLE

AXLE consists of two parts: the Writing Requirement (including a First-Year Writing Seminar) and the Liberal Arts Requirement.

#### *The First-Year Writing Seminar*

The First-Year Writing Seminar is an integral part of the first-year experience in the College of Arts and Science. Through these seminars, first-year students engage in independent learning and inquiry in an environment in which they can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. The small-group nature of these seminars allows for direct student-faculty interaction that stresses training in techniques of scholarly inquiry. The students' written work and oral presentations are subject to thoughtful critical review by the faculty member, providing feedback that can be used to reconsider the manner in which they articulate their ideas and to refine their skills in these areas. Thus, first-year students learn not only about the subject matter of the seminar, but are also exposed to new methods of acquiring knowledge, different ways of expressing and sharing ideas, and unique opportunities to participate in critical inquiry.

All first-year students must enroll in a First-Year Writing Seminar. (First-Year Writing Seminars in the College of Arts and Science are numbered 1111.) This course may be taken during the fall or the spring semester. Students are permitted to enroll in only one First-Year Writing Seminar per semester. All First-Year Writing Seminars also count in their appropriate distribution areas within the Liberal Arts Requirement, but a second seminar will not count toward the writing requirement. Students who transfer into the College of Arts and Science (whether from another school at Vanderbilt or from another college or university) do not complete a First-Year Writing Seminar.

#### *The Writing Requirement*

Excellent communication skills, including the ability to articulate ideas and defend positions in writing, will be paramount for the 21st-century graduates of Vanderbilt University; therefore, all students in the College of Arts and Science must successfully complete the Writing Requirement.

a) All students must demonstrate competence in English composition. Appropriate skills in composition are essential to successful progress at the university. Most students will complete the requirement by presenting a combined score of 1220 on the Writing and Critical Reading sections of the SAT test with a minimum score of 500 in each, or a minimum score of 27 on the English portion combined with a minimum score

of 7 on the Writing portion of the ACT test, or by appropriate AP or IB credit in English. Students who do not must enroll in English 1100 in the freshman year.

b) First-Year Writing Seminar (see above).

c) All students must successfully complete at least one Arts and Science 1000-level writing course (indicated by a “W”) at Vanderbilt University, regardless of AP or IB credits, SAT scores, or ACT scores earned prior to matriculation. These writing-intensive courses emphasize general writing skills within the context of discipline-specific subject matter. All students are encouraged to complete Part b of the Writing Requirement as soon as possible; **this requirement must be completed no later than the fourth semester** at Vanderbilt University. All Arts and Science 1000-level W courses also count in their appropriate distribution areas within the Liberal Arts Requirement. Students may *not* substitute a 2000 or higher-level writing course for the first 1000-level writing course requirement. Students may, however, complete a writing course at the 2000 or higher-level before completing a 1000-level writing course so long as they complete a 1000-level writing course by the end of their fourth semester at Vanderbilt.

d) All students must successfully complete either (1) a second Arts and Science 1000-level W course, or (2) an Arts and Science 2000, 3000, or 4000-level W course, or (3) an approved course in oral communication at Vanderbilt University, regardless of AP or IB credits, SAT scores, or ACT scores earned prior to matriculation. The 2000 and higher-level W courses foster advanced, discipline-specific writing skills. Departments or programs that offer these courses determine their specific writing content. In 2000 or higher-level W courses, continued attention to the process of writing is included in the classroom. Students receive regular feedback on their writing that will contribute toward enhancing writing skills appropriate to specific disciplines. The process of revising written work allows students to reflect on the writing process; writing tutorials may also be included. Oral communication courses focus on developing improved public speaking skills. These courses introduce students to the principles and practices of public discourse and reasoned argument. Attention to the process of effective oral communication is integral to these classes. Students receive regular speaking assignments throughout the semester and regular feedback on their speaking that will contribute toward enhancing effective speaking skills. **All students must complete Part d of the Writing Requirement before graduation.** All Arts and Science 2000 or higher-level W courses and approved oral communication courses also count in their appropriate distribution areas within the Liberal Arts Requirement.

The distribution of all Arts and Science courses into AXLE categories is posted once a year, in the fall, online at: [as.vanderbilt.edu/academics/axle/distribution\\_courses.php](http://as.vanderbilt.edu/academics/axle/distribution_courses.php). The most up-to-date information for any semester is available in the “advanced class search” section of YES.

### *The Liberal Arts Requirement*

The Liberal Arts Requirement consists of successful completion of thirteen courses from the College of Arts and Science. Most courses in the College of Arts and Science fulfill one of these Liberal Arts requirements. Courses must carry three or more credits to count toward the AXLE Liberal Arts Requirement. Although some courses may be appropriate to more than one requirement, each course will fulfill only one requirement. These thirteen courses must be distributed as outlined below. They must be taken from at least seven departments or subject areas.

a) Humanities and the Creative Arts — HCA (3 courses)

Courses in the humanities and the creative arts challenge students to examine their personal understanding of life and how their individual experiences overlap with those of the rest of humankind. These courses testify to the varying ways in which people think, form values, confront ambiguity, express spiritual and aesthetic yearnings, and grapple with moral and ethical problems. By analyzing and interpreting literary, philosophical, religious, or artistic works, students examine the foundations of human experience. By producing original artistic works in imaginative writing, studio art, theatre, film, music, and dance, students have the opportunity to connect the universal sources of human inspiration with their own creative processes.

b) International Cultures — INT (3 courses)

The study of international culture provides students with a basis for understanding the diversity of experiences and values in our contemporary, global society. Options in this category include not only international history and cultural studies courses, but also courses in literature, cinema and media arts, the social sciences, art, music, and languages. Students may satisfy this requirement by choosing courses that focus on the history and culture of a single society or time period in human history and/or that represent a broad spectrum of different human societies and time periods.

Language courses introduce students to the language of a different culture and provide insight into that culture in ways that are not possible to achieve through detached study. At intermediate and advanced levels, students are able to explore the culture in depth, using the language itself to read, discuss, and write about its various aspects. Even at the most basic level, exposure to the language of a different culture prepares students to think and act in terms of living in a global community.

Intermediate and advanced language courses prepare students for study abroad programs, which the College of Arts and Science strongly recommends. A maximum of one course in this requirement may be satisfied through study abroad in a Vanderbilt-sponsored program, or in a pre-approved program offered through another provider. Summer study abroad programs must earn 6 or more credit hours to satisfy this requirement.

In addition to the Vanderbilt-sponsored programs in France and Germany, students may choose from pre-approved study-abroad options in:

Argentina	Jordan
Australia	Kenya
Austria	Morocco
Brazil	Nepal
Canada	Netherlands
Chile	New Zealand
China	Northern Ireland
Costa Rica	Peru
Cuba	Russia
Czech Republic	Samoa
Denmark	Scotland
Dominican Republic	Senegal
England	Serbia
France	Singapore
Germany	South Africa
Hungary	Spain
India	Sweden
Ireland	Switzerland
Israel	Uganda
Italy	Vietnam
Japan	

*Note: All students who study abroad **must** register with International SOS (ISOS). Information is available on the GEO website: [as.vanderbilt.edu/geo](http://as.vanderbilt.edu/geo).*

Additional course credit may be earned toward AXLE curriculum requirements by successfully completing study abroad courses through Vanderbilt in France or the Vanderbilt in Berlin summer program that have A&S numbers and titles. No other courses taken through either of these two programs or through other study abroad programs, including courses offered by Vanderbilt-approved programs and including courses that are deemed to be direct equivalents to A&S courses, count toward AXLE curriculum requirements.

All students must complete three courses in this category, irrespective of previous language study or proficiency in a language other than English. At least one of the three courses presented in fulfillment of this category must be a second-semester (or higher) language acquisition class taught at Vanderbilt University (or through the Duke-UVa-Vanderbilt Partnership for Less Commonly Taught Languages), unless the student successfully demonstrates proficiency in a language other than English at or above the level achieved by second-semester language acquisition classes taught at Vanderbilt University. Students may demonstrate proficiency in a number of ways: SAT Subject Test scores (French, 540; German, 470; Hebrew, 530; Italian, 540; Japanese with Listening, 440; Latin, 530; Spanish, 520); by appropriate score on proficiency tests (written and oral) administered by the Tennessee Foreign Language Institute; or with AP or IB credit in a foreign language. The first semester of an introductory language acquisition class in any language a student has studied for at least two years in high school, or in which a student transfers credit from another institution, cannot be used in partial fulfillment of this requirement. Intensive elementary language courses that cover the content of two semesters in one shall count as one course toward this category.

Students who, because of special ability and achievement, are admitted to the College of Arts and Science without the normally required two years of one foreign language in high school must enroll in a foreign language course during their first semester and must remain continuously enrolled until they successfully complete a full year of one foreign language. They must complete this requirement by the end of their fourth semester in the College of Arts and Science.

c) History and Culture of the United States — US (1 course)

The study of the history and culture of the United States provides students with a basis for understanding the American experience and the shaping of American values and viewpoints within the context of an increasingly global society. Interpreting history and culture in the broadest sense, options in this category include traditional history and cultural studies courses, but also courses in literature, cinema and media arts, the social sciences, art, and music, which illuminate historical periods or cultural themes in United States history. Students may satisfy this requirement by choosing a course that focuses on the history and culture of a single social group or time period in American history and/or that represents a broad spectrum of different social groups and time periods.

d) Mathematics and Natural Sciences — MNS (3 courses, one of which must be a laboratory science)

Courses in mathematics emphasize quantitative reasoning and prepare students to describe, manipulate, and evaluate complex or abstract ideas or arguments with precision. Skills in mathematical and quantitative reasoning provide essential foundations for the study of natural and social sciences.

Students are generally introduced to mathematical reasoning through the study of introductory courses in calculus or probability and statistics.

Courses in the natural sciences engage students in hypothesis-driven quantitative reasoning that helps to explain natural phenomena, the roles of testing and replication of experimental results, and the processes through which scientific hypotheses and theories are developed, modified, or abandoned in the face of more complete evidence, or integrated into more general conceptual structures. Laboratory science courses engage students in methods of experimental testing of hypotheses and analysis of data that are the hallmarks of the natural sciences. Natural science courses prepare students to understand the complex interactions between science, technology, and society; teach students to apply scientific principles to everyday experience; and develop the capacity to distinguish between science and what masquerades as science.

e) Social and Behavioral Sciences — SBS (2 courses)

Social scientists endeavor to study human behavior at the levels of individuals, their interactions with others, their societal structures, and their social institutions. The remarkable scope represented by these disciplines extends from studying the underpinnings of brain function to the dynamics of human social groups to the structures of political and economic institutions. The methods employed by social scientists are correspondingly broad, involving approaches as varied as mapping brain activity, discovering and charting ancient cultures, identifying the societal forces that shape individual and group behavior, and using mathematics to understand economic phenomena. By studying how humans and societies function, students will learn about individual and societal diversity, growth, and change.

f) Perspectives — P (1 course)

Courses in Perspectives give significant attention to individual and cultural diversity, multicultural interactions, sexual orientation, gender, racial, ethical, and religious issues within a culture across time or between cultures, thereby extending the principles and methods associated with the liberal arts to the broader circumstances in which students live. These courses emphasize the relationship of divergent ethics and moral values to contemporary social issues and global conflicts.

### *The Major*

All students must successfully complete a course of study leading to one of the approved major programs in the College of Arts and Science, or successfully complete an individually designed interdisciplinary major designed in consultation with College of Arts and Science faculty and approved by the Committee on Individual Programs in the College of Arts and Science.

### **AXLE Curriculum Course Distribution**

The distribution of Arts and Science courses into AXLE categories is posted once a year, in the fall, online at: [as.vanderbilt.edu/academics/axle/distribution\\_courses.php](http://as.vanderbilt.edu/academics/axle/distribution_courses.php). The most up-to-date information for any semester is available in the “advanced class search” section of YES.

### **AXLE, the Major, and the Optional Minor**

Courses used to satisfy requirements of AXLE may also be used to satisfy requirements of the major or the optional minor.

### Advanced Placement under AXLE

Other than the basic English composition requirement, no AXLE requirement may be fulfilled with any form of advanced placement credit (AP, IB, A-level, etc.).

### Transfer Credit under AXLE

Generally, only courses taken in the College of Arts and Science may be used toward AXLE; however, any college course credit earned **prior** to graduation from high school, and transfer credit earned **before** admission to Vanderbilt, may be used toward fulfilling AXLE requirements.

### Vanderbilt Study Abroad Programs and AXLE

Additional course credit may be earned toward AXLE curriculum requirements by successfully completing study abroad courses through Vanderbilt in France or the Vanderbilt in Berlin summer program that have A&S numbers and titles. No other courses taken through either of these two programs or through other study abroad programs, including courses offered by other Vanderbilt-approved programs and including courses that are deemed to be direct equivalents to A&S courses, count toward AXLE curriculum requirements.

For more information on study abroad, see the chapter on Special Programs for Undergraduates in the front section of this catalog.

## Area of Concentration

During the junior and senior years, much of the student's work is concentrated in one large unit of intellectually related courses. The program of concentration may be arranged through a single major, an interdisciplinary major, or a double major. Each of the three options is described below. A triple major may be declared with the approval of the Administrative Committee.

### Major Field

Under this plan, the student majors in one of the recognized fields. There shall not be fewer than 27 credit hours in the major field, but a given department may require up to 48 credit hours. Students may take more than the required number of credit hours in any major; any given department, however, may limit the total permissible credit hours in a discipline.

For graduation, a student must have achieved a grade point average of at least 2.000 in all classes taken in the major. This set of courses includes all courses a student takes in the department or program of the major and all courses a student takes outside the department or program that may count toward the major. All courses that are listed as fulfilling credit hours required for the major, as listed in the *Undergraduate Catalog*, are included in calculating the grade point average in the major.

Within the framework of these general requirements, each department has its own policies governing major work, which are published elsewhere in this catalog or otherwise available to students.

Academic programs of the College of Arts and Science are varied and broad in scope, with majors offered in the following fields:

Anthropology	German
Art	History
Biological Sciences	History of Art
Chemistry	Mathematics
Classical Civilization	Molecular and Cellular
Classical Languages	Biology
Classics	Philosophy
Communication Studies	Physics
Earth and Environmental	Political Science
Sciences	Psychology
Ecology, Evolution, and	Religious Studies
Organismal Biology	Russian
Economics	Sociology
English	Spanish
Environmental Sociology	Spanish and Portuguese
French	Theatre

Students may also major in defined interdisciplinary programs (listed below). There shall not be fewer than 27 credit hours in the major field, but a given program may require up to 48 credit hours. The student must achieve at least a 2.000 grade point average in all work taken in the major.

African American and Diaspora Studies  
 American Studies  
 Asian Studies  
 Biochemistry and Chemical Biology  
 Cinema and Media Arts  
 Communication of Science and Technology  
 Economics and History  
 European Studies  
 French and European Studies  
 German and European Studies  
 Italian and European Studies  
 Jewish Studies  
 Latin American Studies  
 Latino and Latina Studies  
 Medicine, Health, and Society  
 Neuroscience  
 Public Policy Studies  
 Russian and European Studies  
 Spanish and European Studies  
 Spanish, Portuguese, and European Studies  
 Women's and Gender Studies

Students may combine an interdisciplinary major with a major in one of the recognized fields listed at the beginning of this chapter.

### Declaration of the Area of Concentration

Students may formally declare a major at any time during the third semester of residence and must do so no later than the Friday before Spring Break of the fourth semester. The student selects a department or interdisciplinary program and applies to that department or program for assignment to an adviser. Students who wish to develop an individually designed interdisciplinary program apply to the associate dean who chairs the Committee on Individual Programs.

Each fall a program is arranged that provides for consultation of sophomores with department chairs, for the purpose of

helping students select a major. Sophomore students who have not declared a major should participate in this program if they intend to attain junior standing before the next spring.

The selection of a major is of considerable importance, and the entire program of concentration for the junior and senior years should be planned with the major adviser before the beginning of the junior year. Students officially declare their majors by registering with the chosen department(s) or interdisciplinary program(s), and with the Office of Academic Services in Arts and Science. When the student's major has been registered, access to the student's academic record is transferred from the pre-major adviser to the new major adviser.

Students may not add a major(s) past the fifth class day of the first semester of the senior year.

### **Individually Designed Interdisciplinary Majors**

This plan permits students to contract for an individually designed program of concentration consisting of at least 48 credit hours of approved work. The program is constructed around a coherent academic purpose and may draw together the academic resources of a number of departments and schools. The program's purpose may include topical, period, or area studies, and must be consistent with the philosophy underlying a liberal arts education (see "What is Liberal Education?" on page 48 of this catalog). The program should not be designed with a focus on pre-professional training (e.g., pre-business, pre-law, or pre-medicine). The student may be required to achieve a standard of proficiency in appropriately related areas such as foreign languages or mathematics in addition to the 48 credit hours constituting the program of concentration.

Each student must identify a major adviser who will offer advice and guidance. The major adviser must be a professor or full-time senior lecturer in the College of Arts and Science.

The student's plan for an individually designed interdisciplinary major is a statement of required courses. Furthermore,

because of the nature of interdisciplinary majors, all courses that have previously been included in the student's plan are considered to be part of the major discipline. The student must achieve at least a 2.000 grade point average in all courses that are (or have been) part of the plan.

Upon approval of the Committee on Individual Programs and the student's adviser, (a) as many as 6 credit hours may be counted as part of both the interdisciplinary major and the second major, or (b) normally, no more than three introductory-level courses will be counted toward the interdisciplinary major.

### **Double and Triple Majors**

This program permits a student to concentrate in two or three fields, which may or may not be intellectually related. With approval of the departments concerned, the student completes all of the requirements stipulated for the majors. Triple majors require approval of the Administrative Committee.

Each A&S non-interdisciplinary major must include at least 24 credit hours that are being counted solely toward the major. This rule also applies to students who combine (in a double or triple major) a non-interdisciplinary major with an interdisciplinary major.

### **Approved Second Majors Outside the College**

All undergraduate courses, majors, and minors offered by Blair School of Music, School of Engineering, and Peabody College are approved for students in the College of Arts and Science. See the appropriate sections of the *Undergraduate Catalog* under each school for details. Arts and Science students with a second major from another Vanderbilt undergraduate school must earn a minimum of 90 credit hours in Arts and Science. Consultation with the student's Arts and Science major adviser is especially important.

# Additional Programs

For information on the College Scholars program and departmental honors, please see the chapter titled Honors.

## The Optional Minor

A minor is a program within a recognized area of knowledge offering students more than a casual introduction to the area but less than a major in it. Although the completion of a minor is not a degree requirement, students may elect to complete the courses specified for one or more minors. A student who completes all designated courses in a minor with a grade point average of at least 2.000 will have the minor entered on the transcript at the time of graduation.

Minors may be combined with any departmental major or interdisciplinary major, but minors may not be earned in the department or program of the major. Each minor must, however, include at least 15 credit hours that are being counted solely toward the minor. Courses may not be taken on a P/F basis if they are offered in the department of the minor or if they are being counted toward an interdisciplinary minor (see Academic Regulations).

Minors consist of a minimum of five courses of 3 or more credit hours each. Many minors require a greater number of credit hours and specific courses. When a minor is offered in a discipline that offers a major, only those courses that count toward the major may be counted toward the minor.

Students should refer to the appropriate sections of this catalog for specific requirements. Minors available at present are listed below.

Students should declare their intention to pursue specific minors by completing forms available in the Office of the Associate Deans as well as the various departmental and program offices. Departments and programs assign advisers to students who declare minors in their respective areas. Students have the responsibility to know and satisfy all requirements for minors that they intend to complete.

Students may not add or change a minor after the final day of classes in the second semester of their senior year.

Optional minors are offered in the following fields and interdisciplinary programs:

African American and Diaspora Studies	Earth and Environmental Sciences
American Studies	Economics
Anthropology	English
Art	Environmental Science
Asian Studies	Environmental and Sustainability Studies
Astronomy	European Studies
Biological Sciences	French
Brazilian Studies	German
Chemistry	History
Chinese Language and Culture	History of Architecture
Cinema and Media Arts	History of Art
Classical Civilization	Islamic Studies
Classics	Italian Studies
Communication of Science and Technology	Japanese Language and Culture
Communication Studies	Jewish Studies

Latin American Studies	Physics
Latino and Latina Studies	Political Science
Managerial Studies:	Portuguese
Corporate Strategy	Psychology
Financial Economics	Religious Studies
Mathematics	Russian
Medicine, Health, and Society	Scientific Computing*
Nanoscience and Nanotechnology*	Sociology
Neuroscience	Spanish
Philosophy	Theatre
	Women's and Gender Studies

\*Administered by the School of Engineering in collaboration with the College of Arts and Science

## Approved Minors Outside the College

Arts and Science students are permitted to pursue a second major and/or a minor that has been approved by the faculties of the other Vanderbilt undergraduate schools: the Blair School of Music, the School of Engineering, and Peabody College of Education and Human Development. See the appropriate sections of the *Undergraduate Catalog* under each school for details. Minors may not be earned in the department or program of the major.

## Undergraduate Research

All students have ample opportunity to participate in faculty research projects or to pursue research projects independently, both on campus and at remote sites. Such research has led to the publication of coauthored or student-authored papers and other presentations to the scholarly community. Summer and academic year research by undergraduates in all fields may be subsidized by the university or the College of Arts and Science.

## Study Abroad Programs

Vanderbilt offers study programs for all undergraduate students from Arts and Science, Blair School of Music, School of Engineering, and Peabody College. Among others, programs are offered in Argentina, Australia, Austria, Brazil, Canada, Chile, China, Costa Rica, the Czech Republic, Cuba, Denmark, the Dominican Republic, England, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Jordan, Kenya, Morocco, Nepal, Netherlands, New Zealand, Northern Ireland, Peru, Russia, Samoa, Scotland, Senegal, Serbia, Singapore, South Africa, Spain, Sweden, Switzerland, Uganda, and Vietnam to provide undergraduates immediate contact with cultures different from their own and to aid in the mastery of foreign languages. Students interested in applying for study abroad should consult their advisers to determine whether all degree requirements can be completed on schedule.

Brochures on all approved programs are available in the Global Education Office in Room 115, Student Life Center. GEO also maintains a website, [vanderbilt.edu/geo](http://vanderbilt.edu/geo). The study abroad programs are described in more detail in the chapter on Special Programs for Undergraduates in the front section of this catalog.

When choosing programs in a city for study abroad, College of Arts and Science students may only apply to the Vanderbilt-approved overseas program(s) in that city.

There are four cities/programs for which this rule does NOT apply because of the specificity of the course of study on the Vanderbilt programs: Institut d'Etudes Politiques in Paris, France (designed for social science majors with a high degree of French proficiency); St. Charles University in Prague, Czech Republic (designed for Jewish studies majors); Classical Studies in Rome, Italy (open ONLY to classical studies majors); and Vienna, Austria (open ONLY to Blair students). That is, Arts and Science students who wish to study in Paris, Prague, Rome, or Vienna may choose to study in a program that is not Vanderbilt-approved.

### Additional Options

Students interested in receiving transfer credit for Vanderbilt-approved study abroad programs through other universities should apply to the Committee on Individual Programs. They must meet the same academic standards required for participation in Vanderbilt's study abroad programs. Information is available from the Office of the Associate Deans (350 Buttrick Hall).

It should be noted, however, that if a program has been approved for direct credit by Vanderbilt, it must be taken as the approved direct-credit program by matriculated Vanderbilt students. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved direct-credit program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt.

## Pre-Professional Studies

### Medicine

Students interested in the study of medicine should plan their undergraduate programs in consultation with Professor Michelle Grundy, health professions adviser. There is no formal premedical program of courses in the College of Arts and Science or elsewhere at Vanderbilt. Each student should plan a program to meet individual needs. The program should include whatever courses may be necessary to meet medical school admission requirements, all courses required for the major, all AXLE requirements, and elective options. Students may choose majors from any of the four undergraduate colleges, and may elect to pursue a double major or an interdisciplinary program of concentration.

A student who plans to apply for admission to the Vanderbilt University School of Medicine, as well as other medical schools, may choose either of the following options:

1. A student may qualify for admission with a B.A. degree, whether completed in three years or in four. Minimum requirements for admission generally would be met by completing at least two semesters of English, four semesters of chemistry including organic, two semesters of biology, two semesters of physics, and at least one semester of calculus/math. Since prerequisites may vary across medical schools, students are urged to consult the online resource, *Medical School Admission Requirements (MSAR)* published by the American Association of Medical Schools (at [aamc.org](http://aamc.org)) for school-specific information.

In light of the Medical College Admissions Test (MCAT) changes that took effect in 2015, it is recommended that students take one semester of biochemistry and one semester of introductory statistics. Additionally, through course work or self-directed study, students will need to be knowledgeable in basic concepts of psychology, sociology, and bioethics.

For more information, students are advised to visit the website of the Health Professions Advisory Office ([vanderbilt.edu/hpao](http://vanderbilt.edu/hpao)) and refer to the links for 1) "Premedical Preparation" and 2) "Threading a path through premedical expectations."

2. A student may qualify as a three-year student in the senior-in-absentia program (see Senior-in-Absentia in this catalog).

### Dentistry

Students interested in pre-dental studies should plan their undergraduate program in consultation with Professor Michelle Grundy, health professions adviser. There is no formal pre-dental program of courses at Vanderbilt. Pre-dental studies should include courses necessary to meet dental school admission requirements, all courses required for the major, all AXLE requirements, and elective options. Students may choose majors from any of the four undergraduate colleges. They may also elect a double major or an interdisciplinary program of concentration. A student may apply to dental school under the senior-in-absentia program (see Senior-in-Absentia in this catalog) or apply for admission after three years of college work without a degree.

Any student contemplating application to dental school should take at least two semesters of English, four semesters of chemistry including organic, two semesters of biology, two semesters of physics, and at least one semester of calculus/math. Since prerequisites may vary across dental schools, students are urged to consult the *ADEA Official Guide to Dental Schools* published by the American Association of Dental Schools.

### Nursing

Students interested in developing a program that could lead to a master of science in nursing are advised to consult the Office of Admissions in the School of Nursing. For further information on pre-nursing studies, see the chapter on Special Programs for Undergraduates near the front of this catalog.

### Architecture

Undergraduate students in the College of Arts and Science expecting to pursue architecture at the graduate level should complete at least one year of analytic geometry and calculus and one year of physics. Students may select any major but would want to include courses that emphasize a broad sense of art and architectural history, including courses in studio art. Before applying to specific schools of architecture, they would develop a portfolio of creative work. Further information is available from the pre-architecture advisers: Professor Vesna Pavlović, Department of Art, and Professor Kevin Murphy, Department of the History of Art.

### Engineering

Undergraduate students in the College of Arts and Science expecting to pursue engineering at the graduate level should normally major in a natural science or mathematics and, at a minimum, should complete two years of calculus or its

equivalent, one year each of chemistry and physics, and at least an additional year of a natural science or mathematics. A minimum of one year of computer science is highly desirable. Students should seek specific information concerning admission from the engineering school of their choice as early as possible, preferably by the end of the sophomore year, to assure optimum preparation for entry into that school. Standards for admission vary, but usually a 3.00 average or better is required.

## Law

There is no formal program of prelaw studies at Vanderbilt. Most law schools have no specific requirements for a prelaw curriculum but place great emphasis on the development of the student's ability to read and comprehend accurately, thoroughly, and rapidly; to speak and write clearly and correctly; to think precisely; and to analyze complex situations and weigh and appraise their several elements. The development of analytical skills and of mature study habits is vital. A broad cultural background is important—since law touches life at every point, every subject in the college curriculum may bear on the lawyer's work. Students interested in the study of law should plan their undergraduate programs in consultation with Professor Carrie Russell, prelaw adviser, in the Department of Political Science.

## Management

*Dual Five-Year Baccalaureate–M.B.A. Program.* By combining one and one-half years of study in the Vanderbilt Owen Graduate School of Management with three and one-half years in Vanderbilt's College of Arts and Science, students may obtain both the baccalaureate degree and the M.B.A. degree in five years—the baccalaureate from the College of Arts and Science at the end of the fourth year under the senior-in-absentia program, and the M.B.A. from the Owen School after the fifth.

Students may major in any subject in the College of Arts and Science.

Students must apply to the Owen School for admission to the five-year program during their junior year and to the Administrative Committee of the College of Arts and Science for acceptance into the senior-in-absentia program. Students are subject to normal Owen School admission requirements, and no student is assured of admission to the Owen School. Students who are accepted will be registered in the Owen School for three semesters (a minimum of 48 credit hours). Up to 16 credit hours of Owen School courses approved by the College of Arts and Science may be counted toward completion of the undergraduate degree. Upon acceptance to the Owen School, students should contact the Office of Student Services for an advising appointment. The Owen School registrar will review undergraduate courses and arrange for transfer of those credit hours toward the student's M.B.A. degree.

*Financial Aid.* The scholarship or other financial aid commitment of the College of Arts and Science will not be continued automatically beyond the seventh semester for students enrolled in the dual program. Eighth semester scholarships or other financial aid are the responsibility of the Owen School. The Owen School will advise students of the level of financial support, if any, prior to their enrollment in the dual program, to be provided during the eighth and subsequent semesters. This ensures that an eighth semester scholarship from the College of Arts and Science is protected for the student until a final decision is made to enroll in the Owen School.

*Planning for the Program.* Students interested in this program should consult William Damon or Malcolm Getz in the Department of Economics, or the Owen Admissions Office, for advice on planning undergraduate studies to meet the program's requirements.

## Teacher Education

Details will be found in Licensure for Teaching in the Peabody College section of this catalog.

## Internships

Students may earn academic credit for the work of internships in the College of Arts and Science on a Pass/Fail basis through interdisciplinary or departmental internships. Credit hours earned will not count toward major or minor requirements or toward AXLE, but will count as part of the total credit hours required for graduation. Students obtain their own placement and faculty adviser who works with them to develop a list of readings or research agenda for the internship, which must be approved by the director of internships in the College of Arts and Science (Associate Dean Yollette Jones). The necessary forms for earning academic credit for an internship may be obtained from the A&S Associate Deans' Office in 350 Buttrick Hall, although students register for internships through the Office of Academic Services of their respective school. The deadline for submitting registration forms to Dean Jones's office for internship courses taken during summer term and fall semester is May 1. Students expecting to intern during the spring semester should submit registration forms by January 1.

## Finding an Internship

Students searching for an internship opportunity locally or elsewhere should contact the Career Center.

## Interdisciplinary Internships INDS 3880 (fall, spring), 3884 (summer). 1 credit hour (repeatable)

Any student who is at least a sophomore and in good academic standing may earn one credit hour per semester or summer for an internship under this designation. This course may be repeated twice for a maximum of 3 credit hours exclusively on a Pass/Fail basis.

## Departmental Internships Maximum of 15 credit hours (may be taken only once)

Under this option students from any discipline may earn academic credit for internships in the departments listed below if they meet the minimum GPA requirements and have 6 credit hours of prior work in the department in which they wish to intern. Students are responsible for securing a faculty adviser for the internship and developing an academic plan of work for the internship opportunity, both of which must be approved by the director of undergraduate studies in the department in which the internship is housed. (In some instances, the DUS will serve as the faculty adviser for all internships taken in that discipline.) All internships under this designation are taken concurrently with a research and/or readings course. The latter is taken on a graded basis and may count toward requirements for a major or minor. Students should consult the director of undergraduate studies in the



department of interest to obtain additional information about internships in that discipline. The following departments offer up to 15 credit hours of academic credit per semester or summer for the following courses (internship courses are offered during FALL, SPRING, and SUMMER sessions):

**AADS 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

**AMER 3880–3881.** 3880: Internship Training [1–6], 3881: Internship Readings and Research [3–6].

**ANTH 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [1–6].

**CMA 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [1–6].

**FREN 3880–3881.** 3880: Internship Training in France [1], 3881: Internship Readings and Research in France [3].

**HART 3880, 3883.** 3880: Internship Training [1–9], 3883: Internship Research [1–3].

**HIST 3880, 3882–3883.** 3880: Internship Training [3–9], 3882: Internship Readings [3], 3883: Internship Research [3].

**JS 3880, 3883.** 3880: Internship Training [1–3], 3883: Internship Research [3].

**LAS 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

**MHS 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [1–6].

**PSCI 3880, 3882–3883.** 3880: Internship Training [1–9], 3882: Internship Readings [1–3], 3883: Internship Research [1–3].

**RUSS 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

**SOC 3880–3881.** 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

**SPAN 3880–3881.** 3880: Internship Training in Spain [1], 3881: Internship Readings and Research in Spain [3].

**WGS 3880, 3882–3883.** 3880: Internship Training [1–9], 3882: Internship Readings [1–3], 3883: Internship Research [1–3].

More complete information regarding departmental internship courses may be found in the course descriptions in this catalog. (Courses which have been approved recently by the faculty may not appear in the most recent edition of the catalog.)

### Cost of an Internship

Internships taken during the fall or spring semester will fall under the normal tuition charge unless the student falls below 12 or exceeds 18 credit hours during the semester. In both instances, the hourly tuition charge will apply with permission for an underload/overload from the appropriate academic dean. Students will be charged for internships taken during summer on the basis of the hourly tuition rate for summer school unless approved in advance to receive the internship subsidy (see the Career Center website).

### Combined B.A./M.A. (4+1) Program

The College of Arts and Science offers students in many departments and programs the opportunity to earn both the bachelor's degree and the master's degree in a shorter period of time and at less cost than is normally the case. Exceptional students in the College of Arts and Science can obtain both

degrees in an expedited period, typically within but not less than five years.

The usual period of study for both the bachelor's and the master's degree is six years. Through the 4+1 option, the student and her or his adviser plan a five-year program of study. It is important to note that there is no provision for obtaining both degrees in a period shorter than five years. The program is intended for selected students for whom the master's degree is sufficient preparation for their career goals, is desirable as a goal in itself, or is viewed as additional preparation before pursuing a doctorate or a professional degree.

The areas of study available for the Combined B.A./M.A. (4+1) option within Arts and Science are determined by individual departments and programs, who also determine the policies and guidelines to be followed. Students will be admitted to the Combined B.A./M.A. program only by the invitation and the approval of the department or program.

### Programs of Study

The 4+1 option is currently available in the following departments and programs: English; French; German; history; Latin American studies; mathematics; medicine, health, and society; philosophy; political science; and psychology. Students are welcome to discuss the Combined B.A./M.A. (4+1) option with any of these departments and programs.

### Admissions Overview

The Combined B.A./M.A. program allows Vanderbilt University students to study for both degrees typically, but not necessarily, in the same department. Undergraduates with strong academic records may apply for admission to the program after the first semester of their junior year. Qualifying students are normally accepted into the program in the second semester of the junior year.

To apply for admission, students will first consult with Associate Dean Martin Rapisarda, and then submit to the prospective graduate department or program a "Petition to Apply to the Combined B.A./M.A. (4+1) Degree Program" (available at [vanderbilt.edu/4plus1](http://vanderbilt.edu/4plus1)), a statement of purpose, a formal application to the Graduate School, a preliminary program proposal, two letters of recommendation from Vanderbilt faculty, and a current transcript. Application forms are available for download or can be completed online at [vanderbilt.edu/gradschool](http://vanderbilt.edu/gradschool). GRE scores or other admissions requirements may be specified by the prospective department. Admission to the 4+1 option is highly selective. An accomplished academic record, a demonstrated commitment to pursue graduate study, and a strong endorsement from Vanderbilt faculty are key elements to the successful applicant. Students will be provisionally accepted as graduate students, pending completion of all undergraduate requirements. Graduate student status will apply in the fifth year.

### Advising

Prospective students should discuss with one of their advisers general information on the program and how this program is appropriate to their long-term goals. All students are encouraged to discuss their plans and goals with their undergraduate pre-major and major adviser. Especially in those cases where the intended graduate program differs from the undergraduate major, the student is further encouraged to seek advice from the advisers in the graduate program, too.

## Curriculum

Students in a 4+1 program must satisfy all requirements for both degrees. Advanced Placement (AP) credits will often be used toward satisfying general curriculum requirements, for a maximum of 18 credit hours. The principal distinction between this program and the standard graduate program is two-fold: (1) students are allowed to take master's courses while completing the bachelor's degree, and (2) students are thereby enabled to complete both degrees within five years.

In order to complete the program in five years, students will be expected to complete most, if not all, of the requirements for their undergraduate degree by the end of the first semester of the senior year. Until all baccalaureate requirements are fulfilled, the student will follow College of Arts and Science undergraduate policies and procedures. It is also suggested that students begin taking graduate courses toward the master's degree in the second semester of the senior year. Most graduate programs participating in this option have a non-thesis plan of study requiring 30 graduate credit hours in addition to the requirements for the undergraduate degree. An average load per semester as a graduate student is 9–12 credit hours.

## Scholarships and Financial Aid

Students who are receiving scholarships or other forms of financial aid as a Vanderbilt undergraduate are advised that such aid applies in most cases only toward the completion of the bachelor's degree or the first four years of their studies (which may include their taking some graduate courses during their senior year). Students wishing to pursue the 4+1 option should seek support for their fifth year of study through student loans and other financial aid.

For additional information, contact Associate Dean Martin Rapisarda, 350 Buttrick Hall, [martin.rapisarda@vanderbilt.edu](mailto:martin.rapisarda@vanderbilt.edu), or consult the website [vanderbilt.edu/4plus1](http://vanderbilt.edu/4plus1).

# Honors

## Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the Dean after consideration of faculty recommendations and overall academic achievements, as well as grade point averages of the year's highest ranking summa cum laude graduates.

## Latin Honors Designation

Honors noted on diplomas and published in the Commencement program are earned as follows:

*Summa Cum Laude.* Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's Vanderbilt graduating seniors.

*Magna Cum Laude.* Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's Vanderbilt graduating seniors.

*Cum Laude.* Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's Vanderbilt graduating seniors.

Graduates who complete the requirements of the College Scholars program are awarded "Honors in the College of Arts and Science," and this designation appears on their diplomas. Candidates successfully completing departmental honors programs are awarded honors or highest honors in their major field, and this designation appears on their diploma.

## College Scholars Program

Entering first-year students with outstanding academic records and students who achieve academic distinction during their first semester at Vanderbilt are invited to participate in the College Scholars program. These students have the exclusive opportunity to pursue advanced scholarly work in honors seminars and enriched courses or independent-studies projects. They may earn the designation "Honors in the College of Arts and Science" on their diplomas.

To earn the designation, College Scholars must accumulate fifteen "honors points" by achieving the grade B or better in approved courses and projects. A maximum of thirteen of these honors points may be earned in honors seminars. Honors seminars in the humanities, natural sciences, and the social sciences serve toward satisfaction of AXLE requirements in these areas. For a complete description of how honors points may be earned and a listing of honors seminars offered, see the entry on Honors in alphabetical order under Courses of Study.

College Scholars are not required—although many will choose—to earn honors in the College of Arts and Science; all, however, may enroll in as many honors seminars as they want. To remain in good standing in the program, students must maintain a minimum grade point average of 3.000. Further information on the College Scholars program and honors in the College of Arts and Science may be obtained from Associate Dean Dan Morgan.

## Departmental Honors

To encourage individual development and independent study in a special field of interest, many departments and interdisciplinary programs of the College of Arts and Science offer honors programs for selected, superior candidates. Students normally begin departmental honors work in the junior year, but exceptions may be made in the case of outstanding seniors. To qualify for consideration, students must have (a) attained a minimum grade point average of 3.300 in all work previously taken for credit and in the major, and (b) exhibited to the department(s) and/or interdisciplinary program(s) other evidence of the student's capacity for independent study. Some departments and interdisciplinary programs require higher grade point averages in all work previously taken for credit and/or in the major. Formal admission is by the director of honors study in the Office of the Associate Deans after election by the department(s) and/or interdisciplinary program(s) concerned.

Requirements vary somewhat from department to department (see descriptions in the appropriate department sections of this catalog). Candidates are required to demonstrate some degree of originality and maturity in the methods of independent investigation, analysis, and criticism, and skill in the written presentation of independent work. This standard usually requires a senior thesis but may be satisfied, in departments that have gained approval of this procedure, by a series of briefer critical papers.

Departmental honors work culminates in an examination given in the second semester of the senior year. The examination shall be both oral and written except in departments where honors students must take all courses required of standard majors in addition to those required of honors students. These departments have the option of making the examination either oral or both oral and written. The examination shall be conducted by a committee with a majority of examiners who have not participated in the candidate's honors work. Where feasible, examiners from other institutions may be included. The examination shall cover the thesis and specific fields of the independent work and may, at the discretion of the department, include all of the major work. Successful candidates are awarded honors or highest honors in their field, and this designation appears on their diplomas.

## Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded credit hours, with no temporary or missing grades in any course (credit or non-credit), and no grade of F. A student must be in a degree-granting school.

## Phi Beta Kappa

The Alpha Chapter of Phi Beta Kappa in the state of Tennessee honors scholarly attainments in the liberal arts and sciences and annually elects seniors and juniors to membership during the spring semester.

Seniors who have completed at least 60 credit hours in the College of Arts and Science and earned a cumulative grade point average of 3.65 or higher are eligible for consideration,

as are juniors who have completed at least 70 credit hours at Vanderbilt with a cumulative grade point average of at least 3.90. Juniors must have completed most AXLE requirements by the end of their junior year. For calculating credit hours and judging residence requirements, the chapter treats foreign study programs in the same manner as does the College of Arts and Science.

Attainment of the minimum required grade point average does not guarantee election. Membership in Phi Beta Kappa is based on a demonstration of scholarly achievements, broad cultural interests, and high moral character. The scholarly work must emphasize liberal rather than applied or professional studies. As a guideline, for seniors at least 90 credit hours must qualify as liberal. Grades earned in applied (vocational) or professional course work are not counted in computing the grade point average. The breadth of a candidate's program, as shown by the number and variety of courses taken outside the major, is also considered.

Phi Beta Kappa has long emphasized the importance of mathematics and foreign language in a liberal education. In keeping with this tradition, the chapter considers only those students who have demonstrated proficiency in these areas beyond the AXLE graduation requirements. Proficiency in reading, writing, and speaking a foreign language is typically demonstrated by passing a course in a language at a level at least one semester beyond the AXLE requirements. Courses must be taken on a graded rather than a P/F basis. The foreign language requirement may be satisfied with College Board SAT Subject, Advanced Placement, International Baccalaureate, or Tennessee Foreign Language Institute test scores.

Mathematics proficiency may be demonstrated by completing two semesters of calculus or one semester of calculus and one semester of statistics. Courses must be taken on a graded rather than a P/F basis. The mathematics requirement may be satisfied with Advanced Placement, International Baccalaureate, or A-Level exam credit, but not College Board SAT Subject test scores.

In no event may the total number of persons elected from any senior class exceed 10 percent of the class, and from any junior class exceed six persons. Eligible juniors who are not elected are reconsidered for membership in their senior year.

Refer to the chapter website [my.vanderbilt.edu/hibetakappa](http://my.vanderbilt.edu/hibetakappa) for additional information and detailed eligibility criteria.

### Honor Societies for First-Year Students

First-year students who earn a grade point average of 3.500 or better for their first semester are eligible for membership in the Vanderbilt chapters of Phi Eta Sigma and Alpha Lambda Delta.

### Other Awards and Prizes

MORRIS H. BERNSTEIN JR. PRIZE IN LATIN DECLAMATION. Established in 1983 by William H. Bernstein (B.A. 1983) in memory of his father (B.A. 1943, M.D. 1946). Awarded after a competition, open to any undergraduate who has studied two semesters of Latin, in which participants deliver from memory Latin passages selected to reflect classical ideals.

FOUNDER'S MEDAL FOR ORATORY. Awarded to the senior who has demonstrated the highest standard in public speaking.

FRENCH GOVERNMENT PRIZES. Awarded for excellence in French studies.

EDWIN S. GARDNER MEMORIAL PRIZE FOR EXCELLENCE IN FRENCH. Awarded to a graduating senior who majored in French.

ALEXANDER HEARD AWARD. Presented annually to the outstanding senior political science major.

RICHARD J. LARSEN AWARD FOR ACHIEVEMENT IN UNDERGRADUATE MATHEMATICS. Established in 2005 to honor the commitment to undergraduate education of Richard J. Larsen, member of the faculty from 1970 to 2005. Presented each spring to the senior math major judged by the faculty to have excelled in all aspects of undergraduate mathematics.

AVERY LEISERSON AWARD. Presented for the best research paper or essay written by an undergraduate in a political science course.

MERRILL MOORE AWARD. Endowed in 1961 by Mrs. Merrill Moore, Squantum, Massachusetts, in memory of her husband. Presented to a graduating senior or a student entering the junior or senior class, selected by the Department of English on the basis of "literary promise and the psychological or practical usefulness of the award" to the student.

DANA W. NANCE PRIZE FOR EXCELLENCE IN A PREMEDICAL CURRICULUM. Endowed in 1985 by the family and friends of Dana W. Nance (B.A. 1925, M.D. 1929). Awarded annually to a student who has demonstrated the perseverance to succeed in a premedical curriculum and who embodies the attributes of a caring physician.

JUM C. NUNNALLY AWARD. Established in 1987 in memory of this professor of psychology from 1960 to 1982. Presented to a graduating senior in the honors program of the Department of Psychology for the best research project.

DONALD E. PEARSON AWARD. Presented annually to a graduating senior in chemistry adjudged the most distinguished in undergraduate research in chemistry.

PHI BETA KAPPA FRESHMAN SEMINAR AWARD. Awarded annually to students who have done outstanding creative work in freshman seminars.

AWARD FOR OUTSTANDING RESEARCH IN MOLECULAR BIOLOGY. Presented to a senior in molecular biology for outstanding research performed as part of the major program in molecular biology.

OUTSTANDING SENIOR IN CHEMISTRY AWARD. Presented annually to that graduating senior in chemistry who, in the opinion of the faculty of the Department of Chemistry, shows most promise of an outstanding career.

HENRY LEE SWINT PRIZE. Awarded since 1978 for the best essay in history.

D. STANLEY AND ANN T. TARBELL PRIZE IN ORGANIC CHEMISTRY. Awarded annually to a graduating senior who has excelled in organic chemistry by earning the highest grades in courses or performing outstanding research in organic chemistry.

UNDERWOOD MEMORIAL AWARD. Endowed in 1961 by the late Newton Underwood in memory of his father, Judge Emory Marvin Underwood, long-time member of the Board of Trust. The cash award is given to the most deserving and most promising graduating senior or graduate student in physics.

SUSAN FORD WILTSHIRE PRIZE. Cosponsored by the Women's and Gender Studies program and the Women's Faculty Organization, this award is given annually for the best undergraduate essay that deals with gender issues.

KATHARINE B. WOODWARD PRIZE. Awarded since 1943 and endowed in 1962 by Miss Katharine B. Woodward, Class of 1919, for excellence in Spanish studies.

MARGARET STONEWALL WOOLDRIDGE HAMBLET AWARD. Endowed in 1983 by Clement H. Hamblet in memory of his late wife, who began her art studies at Peabody College. The award is given to a graduating student of outstanding merit in studio art to enable the pursuit of his or her creative development through one year of extensive travel and further studies in studio art.

# Academic Regulations

## Honor System

All academic work at Vanderbilt is done under the Honor System. (See the chapter on Life at Vanderbilt.)

## Class Attendance

Students are expected to attend all scheduled meetings of classes in which they are enrolled; they have an obligation to contribute to the academic performance of all students by full participation in the work of each class. At the beginning of the semester, instructors explain the policy regarding absences in each of their classes, and thereafter they report to the Office of the Associate Deans of the College of Arts and Science the name of any student whose achievement in a course is being adversely affected by excessive absences. In such cases an associate dean, in consultation with the instructor, takes appropriate action, which may include dropping the student from the class; students dropped after the deadline for withdrawal (see Period for Withdrawal) receive the grade *F*. Class attendance may be specified as a factor in determining the final grade in a course, and it cannot fail to influence the grade even when it is not considered explicitly.

The last day before and the first day after official holidays are considered to be the same as any other day on which classes are scheduled. Assignments are made for classes scheduled on these days, and tests may be given in them. Students should take this fact into account in making travel plans.

The faculty of the College of Arts and Science recognizes that occasions arise during the academic year that merit the excused absence of a student from a scheduled class or laboratory during which an examination, quiz, or other graded exercise is given. Examples include participation in sponsored university activities (e.g., debate team, varsity sports), observance of officially designated religious holidays, serious personal problems (e.g., serious illness, death of a member of the student's family), and matters relating to the student's academic training (e.g., graduate or professional school interviews). While determination of the merit of a case is left primarily to the discretion of the individual instructor, conflicts arising from personal travel plans or social obligations do not qualify as excused absences. Except in unusual circumstances, the Office of the Associate Deans does not grant excused absences for students.

The primary determination of whether a student's absence from class occurs for a reason that warrants rescheduling a graded exercise for that student is left to the judgment of the individual instructor. A standard of reasonableness should apply in making such judgments.

Except in cases of true emergency, student petitions for making up missed graded exercises must be made prior to the missed class, preferably at the beginning of the semester or at the earliest time thereafter when the need to be absent is known to the student. Faculty members retain discretion in the form and timing of makeup exercises or in devising other strategies for accommodating students.

The faculty of the College of Arts and Science authorizes the Office of the Dean to resolve through arbitration any cases that cannot be directly resolved between students and their instructors.

## Classroom Recording Policy

The use of technologies for audio and video recording of lectures and other classroom activities is allowed only with the express permission of the instructor. In cases where recordings are allowed, such content is restricted to personal use only unless permission is expressly granted in writing by the instructor and by other classroom participants, including other students. Personal use is defined as use by an individual student for the purpose of studying or completing course assignments. When students have permission for personal use of recordings, they must still obtain written permission from the instructor to share recordings with others.

For students registered with EAD and who have been approved for audio and/or video recording of lectures and other classroom activities as a reasonable accommodation, applicable federal law requires instructors to permit those recordings. Such recordings are also limited to personal use, except with permission of the instructor and other students in the class.

## Course Registrations

### Normal Course Load

Each semester, regular tuition is charged on the basis of a normal course load of 12 to 18 semester hours. No more than 18 or fewer than 12 credit hours may be taken in any one semester without authorization of the Administrative Committee or an associate dean in 350 Buttrick Hall. (There is an extra charge for more than 18 credit hours at the current hourly rate.) First-year students may not take more than 18 credit hours in a semester.

Students permitted to take fewer than 12 credit hours are placed on probation, unless their light load is necessary because of outside employment or illness. During the summer session, there is no minimum course load. Summer loads exceeding 14 credit hours must be authorized by an associate dean in 350 Buttrick Hall.

Credit hours are semester hours; e.g., a three-hour course carries credit of 3 semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements that exceed this definition.

A student must be enrolled in a minimum of 12 credit hours to be classified as a full-time student.

### Auditing

Regularly enrolled Arts and Science students who want to audit courses in any of the undergraduate schools of the university must obtain the written consent of the instructor to attend the class but do not register for the course for credit. Forms are available from the Office of Academic Services in each school. No permanent record is kept of the audit. Regular students may audit one class each semester.

### Taking Courses for No-Credit

Students may want to take elsewhere in the university courses that are not creditable toward the bachelor's degree. They may do so on a no-credit basis, attending classes, doing all the work of the course, and receiving a grade that is recorded on the transcript with a notation that it does not count toward the degree.

No-credit courses count in computation of the student's academic load and in computation of tuition, but not in computation of the grade point average. They also do not count toward the attainment of class standing.

### Taking Courses for P/F Credit

Students may elect to take a limited number of courses on a Pass/Fail (P/F) basis. To enroll for a course on a Pass/Fail basis, students must have completed at least two semesters at Vanderbilt, must have achieved at least sophomore standing, and must not be on academic probation.

No more than 18 credit hours graded *P* may be counted toward the degree, and no more than one course per term may be taken P/F.

The P/F option does not apply to courses in the following categories:

1. Courses counted toward AXLE requirements;
2. Courses in the major field(s), other courses that may be counted toward the major(s), or courses required for the major(s);
3. For students with a defined interdisciplinary major, courses that are required for the major or that are eligible to count toward the major;
4. For students with an individually designed interdisciplinary major, courses listed in the student's plan of study;
5. For students planning an optional minor, courses in the minor field or those eligible to count toward an interdisciplinary minor;
6. Courses that have been specifically excluded from the P/F option;
7. Courses taken previously.
8. Minimum 12 graded credit hours required.
9. A graduating senior who has permission to take fewer than 12 credit hours on a graded basis may take one course on a P/F basis in addition to the courses required for graduation. If the student does not graduate at the end of that semester, the *P* grade is automatically converted to the grade actually earned.

Students may register for grading on a Pass/Fail basis until the close of the Change Period at the end of the second week of classes. Students may change from Pass/Fail to graded status until the deadline date for withdrawing from a course that is published in the Academic Calendar.

Those electing the Pass/Fail option must meet all course requirements (e.g. reports, papers, examinations, attendance, etc.) and are graded in the normal way. Instructors are not informed of the names of students enrolled on a Pass/Fail basis. At the end of the semester, a regular grade is submitted for the student enrolled under the P/F option. Any grade of *D-* or above is converted in the Student Records System to a *P*, while an *F* will be recorded if a student enrolled under this option fails the course. The *P* grade is not counted in the grade point average nor used in the determination of honors. The

grade of *F* earned under the Pass/Fail option is included in the calculation of the grade point average.

The grade for a class will be converted from *P* to the recorded letter grade if a student later declares a major or minor toward which that class counts. The recorded letter grade will be included in both the overall and the major or minor grade point average.

### Undergraduate Enrollment in Graduate Courses

In the 4-digit course numbering system initiated in Fall 2015, some courses may enroll undergraduate and graduate students simultaneously. Typically, there is a 3000- or 4000-level course for undergraduates and a matching 5000-level course for graduate students. Undergraduate students may enroll in the 3000- or 4000-level course of these pairs without special approval.

A qualified Vanderbilt University senior undergraduate may enroll in courses approved for graduate credit (those numbered 5000 and higher) and receive credit that, upon the student's admission to the Vanderbilt Graduate School, may be applicable toward a graduate degree. Vanderbilt cannot guarantee that another graduate school will grant credit for such courses. The principles governing this option are as follows:

1. Work taken under this option is limited to those courses approved for graduate credit (those numbered 5000 and higher) and listed as such in the Graduate School catalog, excluding thesis and dissertation research courses and similar individual research and readings courses. Courses approved for professional credit (i.e., many courses in the Divinity School, Law School, School of Medicine, School of Nursing, and Owen Graduate School of Management) may not be taken as part of this option.
2. The student must, at the time of registration, have a 3.00 average in all prior work to be counted toward the bachelor's degree, or a 3.00 average in all prior work to be counted toward the undergraduate major, or a 3.00 average in the preceding two semesters.
3. The total course load, including both graduate and undergraduate courses, must not exceed 15 credit hours in any semester.
4. No undergraduate student may enroll in more than one graduate course in any semester.
5. A registration form for undergraduate Arts and Science students wishing to exercise this option is available in the College of Arts and Science Associate Deans' Office. The interested student must use this form to obtain the written approval of the following:
  - a) the academic adviser,
  - b) the instructor of the course,
  - c) and the director of graduate studies of the department or program.

### Reserving Credit for Graduate School

1. Arts and Science students who are interested in reserving the credit earned in a graduate course (those numbered 5000 and higher) should consult with the Graduate School before attempting to register for graduate courses under this option.
2. The work must be in excess of that required for the bachelor's degree.

3. All of the above criteria apply under this option.
4. Students must declare their intention to reserve this credit on the registration form.
5. Permission for Vanderbilt undergraduates to enroll in graduate courses does not constitute a commitment on the part of any department to accept the student as a graduate student in the future.
6. An undergraduate student exercising this option is treated as a graduate student with regard to class requirements and grading standards.

### Independent Study and Directed Study Courses

Independent study and directed study courses are intended primarily for students in their junior and senior years. Students may not take an independent study or directed study course that duplicates a regular course being offered in the same semester. Juniors or seniors who wish to take independent study or directed study courses must use the following procedure:

1. Obtain permission to enroll from the instructor of their choice. Consult the instructor prior to the course request period of registration for the semester in which the study is to be undertaken.
2. Register for the course through the appropriate department.
3. Make a written study plan detailing the nature of the project and the amount of credit and have it approved by the instructor and the department chair (or the chair's designee) by the tenth day after classes begin.

Students who have not met these requirements are reported on the tenth-day enrollment report as "registered but not attending" and are dropped from the course.

Students may not repeat independent study or directed study courses for grade replacement. Independent study courses in other schools approved by the College Curriculum Committee may be taken for credit if the project is approved by the Committee on Individual Programs.

### Duplication of Course Content

It is the responsibility of the individual student to avoid duplication in whole or in part of the content of any course counting toward the degree. Such duplication may result in the withdrawal of credit.

### Repeated Courses

Most courses offered in the College of Arts and Science may be repeated. If a course was failed the last time it was taken, credit is awarded when the course is repeated with a passing grade. If a course was previously passed, no new credit is earned. If a course previously passed is repeated and failed, credit originally earned for it is lost. In any case all grades earned are shown on the transcript. Under conditions explained below, the most recent grade in a course replaces the previous grade in determining credit, in computing the grade point average, and in verifying the completion of degree requirements and progress toward the degree.

The policy of grade replacement applies when all of the conditions below are met.

1. A previously passed course is repeated within one year or (for courses not offered within a year) the first time it is offered. Passed courses may be repeated only once. Failed

courses may be repeated at any time and any number of times.

2. Exactly the same course (same department and course number) is completed. For First-Year Writing Seminars, it must be the same department and section number. In addition, a very small number of differently numbered courses as approved by the faculty may be substituted under this policy. These are designated in the departmental course listings.
3. The course is repeated on a regularly graded basis. This limitation applies even if the course was originally taken on a P/F basis.
4. The course is not one in independent study or directed study.
5. A non-W course is taken as repeat credit for a Writing version of the same course that was previously passed. The student loses credit for the writing requirement.
6. A W course is taken as repeat credit for a non-Writing version of the same course that was previously passed. The student earns credit for the writing requirement.
7. Certain courses (e.g., ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credit hours allowable per semester will be included in the course description.

In most instances, enrollment in a course similar to one already completed but with a different course number will result in the award of no credit for the second course and will have no effect on the grade point average.

Courses taken in the College of Arts and Science may not be repeated elsewhere for grade replacement; nor may courses taken elsewhere be repeated in the College of Arts and Science for grade replacement.

Students are cautioned that while repeating for grade replacement a course previously passed may improve their cumulative grade point average, it may also lead to a problem in meeting minimum credit hours requirements for class standing because no new credit is earned.

### The Registration Process

A period is designated in each semester during which continuing students, after consultation with their advisers, register for work to be taken during the next term. The student's adviser must release the advising hold in YES before the student can register.

Students are asked to plan their immediate and long-range educational programs with their faculty advisers before registering and to consult their advisers when they make changes in their registration.

Students not meeting specified tuition payment deadlines are not permitted to register. See the chapter on Financial Information for details.

Before registering, students should check their own records carefully with respect to the following items:

1. AXLE requirements;
2. Major requirements;
3. Requirements of any optional minor(s) sought;
4. Course prerequisites.

### *Period for Withdrawal or Change from P/F Status*

After the Change Period, and extending to the end of the eighth week of classes, a student may withdraw from a course with approval from the student's adviser. Under certain conditions, withdrawal may also require approval from an associate dean in 350 Buttrick Hall. During the same period students may change their status from P/F to regularly graded—but not vice versa—in a course.

These changes must be made with a Change of Course form, which is available online and which the student must submit to the Office of Academic Services in Arts and Science. After the end of the eighth week, withdrawal is possible only in the most extraordinary circumstances, such as illness or unusual personal or family problems. In every case the student, the student's adviser, and an associate dean must agree that late withdrawal is justified by the circumstances. Cases in which agreement is not possible are decided by the Administrative Committee. After the end of the eighth week, change from P/F to regularly graded status is not permitted.

Students who withdraw from a course after the change period receive the grade *W* (withdrawal). This grade is not used in the computation of the grade point average or class rank. A student who defaults in a course without dropping or withdrawing from it receives the grade *F*.

### *Minimum Graded Credit Hours*

A course may not be dropped without authorization of the Administrative Committee or an associate dean if the student is left with a course load of fewer than 12 credit hours on a regularly graded basis.

### **Mid-Semester Progress Reports**

At the end of the seventh week of each semester, instructors assess the progress of all students in their classes and report those whose work at that point is deficient or whose work is being harmed by excessive absences. Grades to be reported are *C-*, *D+*, *D*, *D-*, *F*, and *I* (for incomplete, meaning that some work due by that point has not been submitted). Instructors may combine with one of these grades or assign separately a notation of excessive absences from a class. Reports of these deficiencies are posted to students' Access to Academic Information online summary. Grades given at mid-semester do not become part of the permanent record but are intended to warn students about performance judged unsatisfactory.

### **Examinations**

Each department establishes procedures for evaluating student performance, and normally the method of evaluation is the responsibility of the course instructor. At the beginning of the semester instructors should clearly state the evaluation procedures, including types of examinations, to be used in their courses. Students should have adequate opportunity during the semester to demonstrate their knowledge of the subject matter and should be given an indication of their progress in the course prior to the deadline for dropping courses. Instructors are cautioned against placing excessive weight on the final examination when determining a student's grade in a course.

### *Dead Week*

No examinations of any type—including quizzes, hour examinations, and portions of final examinations—are allowed

during the last week of classes; papers and in-class presentations are permitted during dead week. The Administrative Committee may grant special permission to the instructor in charge of a course to give laboratory examinations during the last regular laboratory period of the last week of classes. The last week of classes is defined as the last seven calendar days preceding the end of classes. If, for example, classes end on Tuesday, then the "dead week" begins the preceding Wednesday and lasts through Tuesday. Students should notify the Office of the Associate Deans of any violation.

### *Final Examinations*

The primary and alternate final examination schedules issued each semester allow two hours for a final examination in each course. Each in-class final examination must be given at the time indicated on the primary schedule. The alternate schedule is used only if the instructor decides to give an in-class examination at two times. The final examination period lasts for about a week and a half.

Alternatives to the standard in-class final examination are permitted at the instructor's discretion. Some examples are take-home examinations, oral examinations, and term papers; there need not be a final examination if adequate evaluation procedures have been used during the term. A take-home or oral examination should make approximately the same demand on a student's time as an in-class examination and should be conducted during the final examination period. A take-home examination must be distributed at the last regular class meeting and must be completed by either the primary or the alternate examination date, whichever is later.

All examinations are conducted under the Honor System.

The instructor's record of grades given during a course and any final examination papers not returned to students must be kept on file by the instructor for the first month of the semester following the conclusion of the course. For spring semester and summer session courses, this rule means the first month of the fall semester.

Monitoring these regulations is the responsibility of the departments, under the supervision of the Office of the Associate Deans. Variations from the regulations—such as changing the time of an in-class final examination for an entire class—are allowed only on approval of the Administrative Committee.

### *Comprehensive Examination*

Any department or interdisciplinary program may require a comprehensive examination of its major students as a condition of graduation.

### *Senior Re-examination*

A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed prevents the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from re-examination. The re-examination must be requested through the Office of the Associate Deans, and if approved, it is given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination will receive a *D-* in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course.



## Credit by Examination

In certain circumstances, students may be awarded course credit by departmental examination. (This procedure is distinct from the award of credit through the College Board Advanced Placement Tests taken prior to the student's first enrollment.)

Students who wish to earn credit by departmental examination should consult the Office of Academic Services in Arts and Science concerning procedures. To be eligible, students must be carrying a minimum of 12 credit hours and be in good standing.

Students must obtain the approval of the chair of the department that is to give the examination and the instructor designated by the chair. Students may earn up to 18 hours of credit by any combination of credit through advanced placement examinations and credit by departmental examination. Students may earn up to 8 hours of credit by examination in any one department. Students may attempt to obtain credit by examination no more than twice in one semester, no more than once in one course in one semester, and no more than twice in one course. Students may not repeat a course for grade replacement under the credit by examination procedures. Credits earned by credit by examination may not be counted toward AXLE.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 credit hours are not charged extra tuition for hours earned through credit by examination, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses and courses dropped after the Change Period. Students in this category must pay a \$50 fee for the cost of constructing, administering, and grading the examination. Since this cost has already been incurred, students who refuse the credit hours and grade are charged the \$50 fee nevertheless.

Full-time students with a tuition load exceeding 18 credit hours and students taking fewer than 12 credit hours pay tuition at the regular rate with no additional fee.

## Grades and Credit

### Grade Reports

Students have access to their grade reports on the Academic Record in YES. Notifications are sent to students in their last two semesters, showing total credit hours, grade point average, and degree requirements still to be met. Students should examine their Degree Audit reports carefully and discuss them with their faculty advisers. Any errors should be reported immediately to the Office of Academic Services in Arts and Science (see also Change of Grade).

### Grading System

- A: excellent
- B: good
- C: satisfactory
- D: minimum pass work
- F: failure

Under certain circumstances the following grades may be awarded:

- W: withdrawal
- P: (see P/F Course Provision)
- M: absent from final examination

- I: incomplete in some requirement other than final examination
- MI: absent from final examination and incomplete work
- IP: first semester grade for two-semester Honors sequence

Plus and minus modifiers may be associated with letter grades *A* through *D* as shown in the table below. Grade point averages are calculated using indicated grade point values.

### Defined Grades with Corresponding Grade Points Per Credit Hour

A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
C+	= 2.3	F	= 0.0

### Grade Point Average

A student's grade point average is obtained by dividing the quality points earned by the credit hours for which the student has registered, excluding courses taken for no credit, those from which the student has officially withdrawn (see Withdrawal Period under Registration above), and those completed with the grade *P*.

In no case is the grade point average affected by transfer credit. No course at another institution in which a grade below *C-* was received, or which was taken on a Pass/Fail basis, is credited toward the degrees awarded by the College of Arts and Science.

### Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. Temporary grades are not calculated in the GPA, but a student who receives a temporary grade is ineligible for the Dean's List. Students cannot graduate with any temporary grades.

### *M*: Missing a Final Examination

The grade *M* is given to a student who misses a final examination and is not known to have defaulted in the course, unless the student could not have passed the course even with the final examination, in which case the grade *F* is given. The course grade of a student known to have defaulted on a final examination is computed on the basis of a score of zero for the final examination. It is the responsibility of the student who misses a final examination to present an excuse to the associate dean immediately. If the excuse is considered adequate, the grade *M* is authorized.

A student who secures authorization for an absence at the proper time is obliged to take a makeup examination during the first full week after the Change Period of the next semester, provided the student is in residence. It is the student's responsibility to contact the Office of the Associate Deans (350 Buttrick Hall) before the second day of classes to schedule the makeup. If the student is not in residence, the grade *M* must be removed by a makeup examination given within a maximum period of one year from the date of the missed examination and during one of the regular makeup examination periods. If the student fails to take the makeup examination within the prescribed time, the *M* grade will be replaced by a default grade submitted by the instructor when the *M* is assigned.

### *I: Incomplete*

The grade of *I* is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The *I* is not intended as a replacement for a failing grade, nor should it be assigned if a student simply misses the final examination. The grade of *M* is used for the latter purpose. The grade for a student who misses a final examination and whose work is also incomplete in other respects is reported as *MI*. The request for an *I* is generally initiated by the student but must be approved and assigned by the instructor. When assigning an Incomplete, the instructor specifies (a) a deadline by which the *I* must be resolved and replaced by a permanent grade and (b) a default course grade that counts the missing work as zero. The deadline may be no later than the end of the next regular semester. The Incomplete can be extended beyond the next semester only if an associate dean determines that an extension is warranted. If the required work is submitted by the deadline for removing the Incomplete, the *I* will be replaced by the grade earned. If the work is not completed by the deadline, the default grade will become the permanent grade for the course.

### *MI: Missing a Final Examination and Other Work*

The grade for a student who misses a final examination and whose work is also incomplete in other respects is reported as *MI*. This grade may not be turned in without prior authorization by an associate dean. It is the student's responsibility to contact the Office of the Associate Deans (350 Buttrick Hall) to request permission to take a makeup examination and to arrange for the submission of the missing work.

### *Makeup Examinations*

For students who receive the authorized grade *M*, the Office of the Associate Deans will arrange makeup examinations during the next semester, but it is the responsibility of the student to schedule the makeup at the Office of the Associate Deans (350 Buttrick Hall) before the second day of classes. The makeup examination period is the first full week after the Change Period of each semester. The Administrative Committee may on occasion authorize a makeup examination at some time other than the makeup period for a particular student.

### *F: Failure*

The grade *F* indicates failure. All *F*'s are counted in the computation of grade point averages, except when a course is repeated and is subsequently passed. In this case the latest grade is used for computation of the grade point average (but the grade originally earned is not removed from the transcript). A course in which the grade *F* is received must be repeated as a regular course if credit is to be given. It may not be repeated as a course in independent or directed study, under the procedures for credit by examination, or on a P/F basis.

### **Change of Grade**

A grade reported and recorded in the Office of the University Registrar may be changed only upon written request of the instructor with the approval of the Administrative Committee. The committee will approve such a change only on certification that the original report was in error.

### **Transfer Credit**

It is the student's responsibility to provide all of the information needed by the College of Arts and Science to assess the program for which transfer of credit is requested. Work presented for transfer must be from an accredited college and is subject to evaluation in light of the degree requirements of the College of Arts and Science. Students seeking transfer credit for work at nonaccredited institutions will be considered individually. Correspondence courses will not be considered for transfer credit.

Work transferred to Vanderbilt from another institution will not carry with it a grade point average. No course in which a grade below C- was received, or which was taken on a Pass/Fail basis, will be credited toward a degree offered by the College of Arts and Science. The question of credit in the College of Arts and Science for previous work done at another institution must be settled in advance of the student's first registration. Credit for previous work will not be added to the student's record after matriculation. Credit will not be awarded for internships.

Transfer students must spend at least four full semesters, including the last two semesters, enrolled in the College of Arts and Science. They must earn at least 60 credit hours and complete at least one writing course in fulfillment of the writing requirement while so enrolled.

### **Residence Requirement**

A minimum of four normal semesters (at least 60 credit hours), including the last two semesters (at least 30 credit hours), must be spent in residence in the College of Arts and Science unless an exception is made by the Administrative Committee. Students transferring from other schools of the university must spend the last year (at least 30 credit hours) in residence in the College of Arts and Science.

### **Summer Work at Another Institution**

Students enrolled in the College of Arts and Science may receive transfer credit for a maximum of two courses taken during summers at another four-year, fully accredited institution. To qualify for such credit, the student must be in good standing and must obtain authorization from an associate dean and the appropriate department in advance of taking the course. Such courses cannot fulfill AXLE requirements, count as part of the last 30 credit hours in residence, duplicate a course taken previously, or be taken on a Pass/Fail or similar basis. Credit will not be awarded for internships.

### **Semester Work at Another Institution**

Students who wish to receive transfer credit for a semester of work at another institution must receive approval in advance from the Committee on Individual Programs. To qualify for such credit, the student must be in good standing and must present to the committee a plan that makes clear the educational rationale for such work, the ways in which it supplements the Vanderbilt curriculum, and the equivalence of standards to those at Vanderbilt. Approval of the overall plan by this committee must be followed by approval of specific courses by the student's adviser, the appropriate department in the College of Arts and Science, and the Office of Academic Services in Arts and Science. Such courses cannot fulfill AXLE requirements, count as part of the last 30 credit hours in residence, duplicate a course taken previously, or be taken on a Pass/Fail or similar basis. Credit will not be awarded for internships.

### Senior-in-Absentia

A student who wishes to earn a baccalaureate degree in the College of Arts and Science in absentia must have (a) completed the AXLE requirements and all major requirements; (b) earned at least 105 credit hours and a grade point average of 2.000 with at least 60 credit hours earned in a minimum of four semesters of residence in the College of Arts and Science; (c) been accepted at a professional or graduate school where, during the first year, the remaining credit hours needed for graduation can be earned; and (d) obtained the approval of the major department and an associate dean of the College of Arts and Science. Students who have completed fewer than 105 credit hours may petition the Administrative Committee for special consideration.

The limitation on credit hours outside the College of Arts and Science applies to all bachelor of arts candidates.

Students in the senior-in-absentia program pay a minimum semester tuition charge to the College of Arts and Science (see Financial Information).

### Student Leave of Absence

A student desiring a leave of absence should obtain application forms and instructions from the Office of the Associate Deans of the College of Arts and Science. All students are eligible, provided they have not been dropped by the university and are not dropped at the end of the semester during which application is made. But students may take a leave no more than twice during their career in the College of Arts and Science.

Leaves are granted for one semester or for a year. Applications should be completed before the end of the fall semester for a leave of absence during the spring semester, and before August 15 for a leave of absence during the fall semester (or for the academic year). If the leave is approved, the student must keep the Office of the University Registrar informed of any change of address while on leave.

A student who takes a medical leave after mid-semester is expected to be on leave for the following regular semester as well. A student who plans to return from medical leave must submit appropriate documentation to the Offices of the Associate Deans and of Student Care and Community Support at least forty-five days before the first day of class.

A student who seeks to transfer to Vanderbilt credit earned elsewhere while on leave of absence must obtain permission in advance from the Committee on Individual Programs. Applications for leaves of this type must be filed with the committee at least one month before the close of the preceding semester.

Registration information is emailed to students on leave of absence. A student failing to register at the conclusion of the stated leave will be withdrawn from the university and must apply for readmission.

### Withdrawal from the University

Students proposing to withdraw from the university during a regular term must report to the Office of the Associate Deans of the College of Arts and Science to initiate proper clearance procedures. If withdrawal from the university is officially authorized, the student will receive withdrawal grades on the same basis as a student withdrawing from a particular course or courses. (See the section on Period for Withdrawal under Registration above.)

### Change of Address

Students are responsible for keeping the university informed of their correct mailing addresses, both school and home.

They should notify the university, through the Office of the University Registrar, online or in writing, of any address changes as soon as possible. They are provided an opportunity to review address information at registration. The university will consider notices and other information delivered if mailed to the address on file in the Office of the University Registrar.

### Academic Discipline

The College of Arts and Science requires each student to maintain an academic record that will permit graduation according to a specified schedule. Students are considered to fall short of the expected rate of progress when

1. They pass fewer than 12 credit hours in a semester or have a semester grade point average lower than 1.500; or
2. In a summer they take 12 or more credit hours but pass fewer than 12 credit hours or earn a grade point average lower than 1.500; or
3. They fail to achieve sophomore, junior, or senior standing within the time allowed; or
4. They accumulate more than two probations after the freshman year, in which case they will normally be dropped from the university; or
5. As first-semester freshmen they pass fewer than two courses or earn a semester grade point average lower than 1.000, in which case they may be required to take a probationary leave of absence; or
6. As first-semester freshmen they earn fewer than 9 credit hours or a semester grade point average lower than 1.500, in which case they may be offered a choice (see Semester Requirements below).

Any student who falls somewhat short of the prescribed levels of academic achievement is normally placed on probation. Any student who fails by a wide margin to reach these levels or who has been placed on probation more than once is reviewed by the Administrative Committee, and may be dropped from the university without having previously been placed on academic probation. The committee considers each case within the framework of the guidelines outlined below and may take any of several actions, among which are the following:

1. The student may be placed on probation;
2. The student may be advised to take a leave of absence or to withdraw from the university;
3. The student may be required to take a leave of absence;
4. The student may be dropped from the university.

### Semester Requirements

Full-time students are expected to earn each semester at least 12 credit hours and a minimum grade point average of 1.500. Students who fall short of these levels are normally placed on probation. Students are removed from probation after earning at least 12 credit hours and a semester grade point average of 1.500 or better, assuming they have fulfilled the requirements for class standing stated below.

First-year students who pass fewer than two regular courses in their first regular semester or who earn a semester grade point average lower than 1.000 have so seriously compromised their academic standing that they may be required

to take a probationary leave of absence until the beginning of the following fall semester.

First-year students who earn fewer than 9 credit hours or a grade point average lower than 1.500 in the fall may, at the discretion of the Administrative Committee, choose a probationary leave for the spring and return the next fall with two semesters in which to qualify for sophomore standing.

A student on probationary leave may not earn credit at another institution for transfer to Vanderbilt. In appropriate cases the Administrative Committee may prescribe conditions that must be satisfied before the student returns from a probationary leave. Students who do not choose to return at the end of a probationary leave but want to return later are required to apply for readmission.

After their first year, full-time students may not be placed on probation more than twice (continuance on probation for a second semester counts as another probation). If a student's performance is deficient a third time, the student is dropped from the university.

Students who have been authorized to carry fewer than 12 credit hours because of illness or outside employment may be placed on academic probation if their work is deemed unsatisfactory by the Administrative Committee; they are removed from probation when the committee deems their work satisfactory. If they are not removed from probation after a reasonable period of time, such students are dropped.

The internal record of a student dropped from the university under these regulations shows the notation "Dropped for scholastic deficiency."

### **Class Standing**

The Administrative Committee determines how many semesters will be allowed for each part-time student to attain sophomore, junior, or senior standing.

The internal record of a student dropped from the university under these regulations shows the notation "Failed to qualify for class standing."

### *Sophomore Standing*

A student qualifies for sophomore standing upon completion of 24 credit hours of work with a grade point average of at least 1.800, completion of two regular semesters (fall or spring), and completion of the first-year writing requirement: successful completion of English 1100 if required and successful completion of a First-Year Writing Seminar (numbered 1111 in various disciplines). First-year students who fail to qualify for sophomore standing in two semesters are placed on probation and must have the permission of the Administrative Committee to register for a third semester. The third semester must be the summer semester at Vanderbilt. Normally, students who do not qualify for sophomore standing during this third semester are dropped from the university.

### *Junior Standing*

A student qualifies for junior standing upon completion of 54 credit hours of work with a grade point average of 1.900, completion of four regular semesters (fall or spring), and completion of a 1000-level writing course. Sophomores who fail to qualify for junior standing within two semesters after qualifying for sophomore standing are placed on probation and must have the permission of the Administrative Committee to register for another semester. This additional semester

must be the summer semester at Vanderbilt. Normally, students who do not qualify for junior standing in this additional semester are dropped from the university.

### *Senior Standing*

A student qualifies for senior standing upon completion of 84 credit hours of work with a grade point average of 2.000 and completion of six regular semesters (fall or spring). Juniors who fail to qualify for senior standing within two semesters after qualifying for junior standing are placed on probation and must have the permission of the Administrative Committee to register for another semester. This additional semester must be the summer semester at Vanderbilt. Normally, students who do not qualify for senior standing in this additional semester are dropped from the university.

Seniors who fail to maintain a minimum grade point average of 2.000 are placed on probation and must have the permission of the Administrative Committee to register for another semester.

### **Petitions and Appeals**

The Administrative Committee of the College of Arts and Science entertains petitions from currently enrolled students for exceptions to academic regulations. Any student subject to action by the Administrative Committee may appeal that action to the committee in writing. Further appeals from decisions of the committee follow standard university policies as described in the *Student Handbook*.

### **Returning to the College**

Students on leave of absence return to the university at the end of the leave. If they do not return at that time and want to return later, they must apply to the Office of the University Registrar for readmission. Students who are advised to withdraw from the university determine whether or not to return in consultation with the Office of the Associate Deans. Students who have been dropped may apply to the Office of the University Registrar for readmission; in most cases readmission is not granted unless there has been an intervening period of at least a year. The Office of the University Registrar forwards all documents to the Administrative Committee, which considers each case on an individual basis. Readmission is competitive, and there is no assurance that it will be granted. Students readmitted after having been advised to withdraw or after having been dropped are automatically on final probation. If they fail to regain good standing and to maintain it until graduation, they are dropped again with little prospect for readmission. Application deadlines for readmission are as follows: July 15 for the fall semester, November 15 for the spring semester, and April 1 for the summer session.

# College of Arts and Science Programs of Study

## African American and Diaspora Studies

DIRECTOR Tracy D. Sharpley-Whiting  
 DIRECTOR OF UNDERGRADUATE STUDIES Tiffany R. Patterson  
 DIRECTOR OF GRADUATE STUDIES Gilman W. Whiting  
 PROFESSORS Victor Anderson, Houston Baker, Tracy D.  
 Sharpley-Whiting

ASSOCIATE PROFESSORS Tiffany R. Patterson, Gilman W. Whiting  
 MELLON ASSISTANT PROFESSOR Alicia Monroe  
 SENIOR LECTURER Claudine Taaffe  
 WRITER IN RESIDENCE Alice Randall

THE concentration in African American and Diaspora Studies requires 36 credit hours of course work. Approved courses taken at Fisk University may be counted as electives in the program. The course of study in the African American and Diaspora Studies program is divided into three areas: Area of Study I, Gender and Sexuality; Area of Study II, Literature, Theory, and Visual Culture; and Area of Study III, Social Sciences. Courses that satisfy each area are listed under “Areas of Study and Electives” below.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in African American and Diaspora Studies

Requirements for the major include at least 36 hours of credit as follows:

1. 3 credit hours from 1010, Introduction to African American and Diaspora Studies.
2. 6 credit hours from Area of Study I, Gender and Sexuality.
3. 6 credit hours from Area of Study II, Literature, Theory, and Visual Culture.
4. 6 credit hours from Area of Study III, Social Sciences.
5. 9 credit hours of electives chosen from Areas of Study I, II, and III, not used to satisfy requirements 2 through 4 above.
6. 3 credit hours from 4278, Research Methods. Majors are advised to take this course in the first semester of their junior year.
7. 3 credit hours in either 4978 (fall) or 4979 (spring), Senior Thesis in African American and Diaspora Studies.

At least 6 credit hours of the concentration must focus on the Americas (outside of the United States) and/or Africa. No more than 9 credit hours of course work may be taken at the 1000 level (excluding 1010).

### Honors Program

The only route to honors in the major is writing a 3 credit hour Senior Honors Thesis in AADS 4998 (fall) or 4999 (spring) and passing an oral examination. Admission to the Honors Program

requires a student have a grade point average of at least 3.5 in all AADS courses and a cumulative GPA of 3.3. A committee of three faculty members (two of whom must be involved in undergraduate teaching in the African American and Diaspora Studies program) will evaluate the thesis. Students pursuing the Senior Honors Thesis may apply to the program for nominal funding to assist with research projects. The chair of the student's thesis committee and two readers must attend the oral examination. The oral defense will typically take place in the second semester of the student's senior year.

### Minor in African American and Diaspora Studies

Requirements for completion of the minor include at least 21 credit hours as follows:

1. 3 credit hours in 1010, Introduction to African American and Diaspora Studies.
2. 3 credit hours from Area of Study I, Gender and Sexuality.
3. 3 credit hours from Area of Study II, Literature, Theory, and Visual Culture.
4. 3 credit hours from Area of Study III, Social Sciences.
5. 9 credit hours of electives chosen from Areas of Study I, II, and III, not used to satisfy requirements 2 through 4 above.

At least 6 credit hours of the minor must focus on the Americas (outside of the United States) and/or Africa, and no more than 6 credit hours of the minor can be taken at the 1000 level (excluding 1010). Minors are encouraged, though not required, to take 4270 Research Methods in the first semester of their junior year.

### Areas of Study

Courses with an asterisk in the lists below fulfill the Africa and Americas outside of the United States portion of the major and minor. Approved courses offered at Fisk may count toward elective requirements.

#### Area of Study I, Gender and Sexuality

AADS: 1204\* Diaspora Feminisms; 2104\* Popular Culture and Black Sexual Politics; 2204\* Black Women and the Politics of Blackness and Beauty; 2214 History & Myth: Black Women in the United States; 2294\* Black Paris–Paris Noir: The African Diaspora and the City of Light; 2654 Memoirs and Biographies; 3104W Soul Food as Text in Text: An Examination of African American Foodways; 3204W African American Children's Literature; 3214 Black Masculinity: Social Imagery and Public Policy; 4264\* Black Diaspora Women Writers.

#### Area of Study II, Literature, Theory, and Visual Culture

AADS: 1016\* Race Matters; 1506\* Reel to Real: Film Aesthetics and Representation; 1706\* Capoeira; 2166 Blacks in Country Music; 2306 Race, Mixed Race, and “Passing”; 2356\* African Spirits in Exile: Diaspora Religions in the Americas; 3206 Mystery, Murder, and Mayhem in Black Detective Fiction; 4256\* Haiti: Freedom, Democracy.

#### Area of Study III, Social Sciences

AADS: 1108\* Making of the African Diaspora; 1408\* Blacks in Latin America and the Caribbean; 2168\* Black Migrations in the African Diaspora; 2178\* Global Africa; 2208\* Colonialism and After; 3208W Blacks in the Military;

3258 Black Issues in Education; 3278\* Black Europe; 3458\* Atlantic African Slave Trade; 4198\* Global Anti-Blackness and Black Power\*; 4270 Research Methods.

### Other Electives

Any course from the above three areas may serve as an elective if it is not already being used to satisfy an Area requirement. Please consult the director of undergraduate studies for periodic updates about electives including courses that can be taken at Fisk as electives for AADS.

AFRICAN AMERICAN AND DIASPORA STUDIES: 1111\* First Year Writing Seminar.

ANTHROPOLOGY: 2105\* Race in the Americas\*; 2106\* Culture and Power in Latin America\*.

ECONOMICS: 2150\* Economic History of the United States.

ENGLISH: 3654\*/3654W\* African American Literature; 3658\* Latino-American Literature; 3674\* Caribbean Literature; 3742\* Feminist Theory.

FRENCH: 3232\* Introduction to Francophone Literature\*; 4023\* The African Novel\*.

HISTORY: 1270\* Sub-Saharan Africa 1400–1800\*, 1280\* Africa since 1800\*; 1410\* U.S. 1877–1945: Reconstruction through World War II; 1440\* African American History since 1877; 2450\* Reform, Crisis, and Independence in Latin America, 1700–1820; 2490\* Brazilian Civilization; 2570\* Caribbean History 1492–1983; 2620\* The Old South; 2630\* The New South; 2680\* Black New York; 2690\* The Civil Rights Movement; 3040\* Health and African American Experience; 3200\* Poverty, Economy, Society in Sub-Saharan Africa; 3250W\* Blacks and Money.

HISTORY OF ART: 4960\* Advanced Seminar in History of Art.

MUSIC: 1100\* World Music\*; 1105\* African Music\*; 1600\* American Popular Music; 1620\* Survey of Jazz; 1630\* The Blues; 2150\* Music, Identity, and Diversity.

RELIGIOUS STUDIES: 1100\* Introduction to African American Religious Traditions; 3119\* Martin Luther King, Jr., and the Social Roles of Religion.

SOCIOLOGY: 3207\* Popular Culture Dynamics; 3304\* Race, Gender, and Health; 3702\* Racial and Ethnic Minorities in the United States; 3711\* Women, Gender, and Globalization; 3722\* Gender in Society; 3723\* Gender, Sexuality, and the Body.

SPANISH: 3835\* Latino Immigration Experience\*; 4750\* Afro-Hispanic Literature\*.

WOMEN'S AND GENDER STUDIES: 1150\*/1150W\* Sex and Gender in Everyday Life; 2240\* Introduction to Women's Health; 3250\*/3250W Contemporary Women's Movements.

Course descriptions begin on page 136.

## American Studies

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ASSISTANT DIRECTOR Gabriel Torres-Colón

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SENIOR LECTURER Chalene Helmuth (Latin American Studies)  
OTHER AFFILIATED FACULTY Joe Bandy (Assistant Director of the Center for Teaching)

THE Program in American Studies is an interdisciplinary program that enables students to explore the diversity of American culture from a variety of intellectual disciplines and perspectives. Through course offerings, colloquia, and research opportunities, program students and faculty engage the states of the nation, examining the formation of social, legal, cultural, and economic identities within the borders of the United States and globally in relation to the United States. Compelling matters of class, race, ethnicity, sexuality, migration, environmentalism, technology, the arts, region, and religion take their proper and vital place in the curriculum of study. As the United States is a multilingual nation, the program identifies itself within the larger geographic and geopolitical parameters of the Americas, including Canada, Mexico, the Caribbean, Central and South America. American studies, in addition, addresses itself to important distinctions within the concept of globalization, ranging from transnational corporate activities to those of nongovernmental organizations committed to such projects as public health, philanthropy, and nutrition. The American Studies program particularly encourages and provides opportunities for on- and off-campus research, internships, study abroad, and individualized and group projects under the guidance of participating faculty in the humanities, arts, and social sciences.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in American Studies

The interdisciplinary major in American studies consists of 36 credit hours of course work, distributed as follows:

- |                              |                 |
|------------------------------|-----------------|
| 1. Core Requirements         | 6 credit hours  |
| 2. International Requirement | 3 credit hours  |
| 3. Distribution Requirements | 18 credit hours |
| 4. Electives                 | 9 credit hours  |

*Note:* No course may be counted twice in calculating the 36 credit hours. No more than 6 credit hours at the 1000 level can count toward the interdisciplinary major. Students seeking a second major may count a maximum of 6 credit hours of course work toward meeting requirements in both majors.

### 1. Core Requirements (6 credit hours)

Core Courses:

AMER 4000, The American Studies Workshop (3 credit hours)

AMER 4960, Senior Project (3 credit hours)

### 2. International Requirement (3 credit hours)

One of the following:

- A semester abroad in a Vanderbilt-approved study abroad program and an additional 3-credit-hour elective
- AMER 3200, Global Perspectives on the U.S. (3 credit hours)
- One of the following:

ANTHROPOLOGY: 3161, Colonial Encounters in the Americas.

ASIAN STUDIES: 2560, Current Japan–U.S. Relations.

ECONOMICS: 4520W, Seminar on Globalization.

ENGLISH: 3674, Caribbean Literature; 3898, 3898W, Special Topics in English and American Literature.

HISTORY: 1370, Colonial Latin America; 1380, Independence in Latin America; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2460, Colonial Mexico; 2470, Revolutionary Mexico; 2480, Central America; 2510, Reform and Revolution in Latin America; 2535, Latin America and the United States; 2570, Caribbean History, 1492–1983; 2700, The U.S. and the World; 2710, The U.S. as a World Power; 3890, Selected Topics in History.

INTERDISCIPLINARY STUDIES: 3831, Global Citizenship and Service; 3832, Global Community Service; 3833, Seminar in Global Citizenship and Service.

JEWISH STUDIES: 2450, The Jewish Diaspora.

LATIN AMERICAN STUDIES: 2101, Introduction to Latin America; 2301, Music of Protest and Social Change in Latin America; 3891, Special Topics in Latin American Studies.

POLITICAL SCIENCE: 3217, Latin American Politics; 2219, Politics of Mexico; 2225, International Political Economy; 3228, International Politics of Latin America; 2236, The Politics of Global Inequality.

RELIGIOUS STUDIES: 4551, Islamic Mysticism.

SOCIOLOGY: 3231, Contemporary Latin America; 3232, Contemporary Mexican Society.

SPANISH: 3370, Spanish American Civilization; 3375, Film and Culture in Latin America; 4740, Spanish-American Literature of the Boom Era; 4741, Spanish-American Literature of the Post-Boom Era.

### 3. Distribution Requirements (18 credit hours)

6 credit hours from at least two different departments or programs in each of the following three areas:

- Humanities: Classical Studies, Communication Studies, English, History of Art, Music, Philosophy, Religious Studies, Spanish and Portuguese, Theatre.
- Social Sciences: Anthropology, Economics, History, Political Science, Sociology.
- Interdisciplinary Programs: African American and Diaspora Studies; American Studies; Cinema and Media Arts; Earth and Environmental Sciences; Jewish Studies; Latin American Studies; Medicine, Health, and Society; Women's and Gender Studies.

*Note:* See below for a list of approved courses in each of these areas.

### 4. Electives (9 credit hours)

Three courses taken from the approved list of courses. Students should choose these courses in consultation with their adviser to form a study of concentration.

### Minor in American Studies

The interdisciplinary minor in American studies consists of 18 credit hours of course work, distributed as follows:

- |                              |                |
|------------------------------|----------------|
| 1. Core Requirements         | 3 credit hours |
| 2. International Requirement | 3 credit hours |
| 3. Distribution Requirements | 9 credit hours |
| 4. Electives                 | 3 credit hours |

*Note:* No course may be counted twice in calculating 18 credit hours. No more than 6 credit hours at the 1000 level can count toward the interdisciplinary minor. Students seeking a minor may count a maximum of 3 credit hours of course work toward meeting requirements in both their major and minor.

### 1. Core Requirements (3 credit hours)

Core Course: AMER 4000, The American Studies Workshop (3 credit hours)

### 2. International Requirement (3 credit hours)

One of the following:

- A semester abroad in a Vanderbilt-approved study abroad program and an additional 3-credit-hour elective.
- AMER 3200, Global Perspectives on the U.S. (3 credit hours)
- One course from the list of courses under the International Requirement, part C, of the major.

### 3. Distribution Requirements (9 credit hours)

3 credit hours in each of the following three areas:

- Humanities:* Classical Studies, Communication Studies, English, History of Art, Music, Philosophy, Religious Studies, Spanish and Portuguese, Theatre
- Social Sciences:* Anthropology, Economics, History, Political Science, Sociology, Psychology
- Interdisciplinary Programs:* African American and Diaspora Studies; American Studies; Cinema and Media Arts; Earth and Environmental Sciences; Jewish Studies; Latin American Studies; Medicine, Health, and Society; Women's and Gender Studies

*Note:* See below for a list of approved courses in each of these areas.

### 4. Electives (3 credit hours)

One to two courses taken from the approved list of courses. Students should choose this course in consultation with their adviser to form a study of concentration.

### Honors Program

The Honors Program in American Studies offers superior students a more intensive concentration within their major field. The program requires:

- Completion of the requirements of the major.
- A 3.3 cumulative grade point average.
- A 3.5 cumulative grade point average in American studies.

4. 6 credit hours in the fall and spring semesters of the senior year in AMER 4998/4999 devoted to a major research project leading to an honors thesis. 4999 counts as the Senior Project (4960), and 4998 counts as elective credit for the requirements of the major.
5. An Honors thesis to be completed by the spring of the senior year.
6. Successful completion of an oral examination focusing on the topic of the thesis.

Exceptional achievement on the thesis will earn highest honors. Applications are accepted in March of the junior year. Additional information is available from the director of the American Studies program.

### *General Advice for Majors and Minors*

We encourage students to enter the major through a number of avenues: a first-year seminar, our introductory course to the major, AMER 1002/1002W, or an introductory course in a particular discipline or program. While we do not require a set path into the major, up to 6 credit hours of introductory courses can count toward the major.

Once having declared a major or minor, students should work closely with their adviser to develop a coherent plan of study. We encourage students to concentrate on a theme or topic of special interest, either by choosing courses with a topical coherence each semester or by choosing a single topic to focus their major around. We also highly encourage our majors to seek opportunities for study abroad or internship possibilities. Students should plan on taking the American Studies Workshop during their junior year and our capstone course, the Senior Project, during their senior year. Distributional requirements and electives should be decided in conjunction with the student's adviser.

We also encourage our students to participate in American Studies programming that occurs outside the classroom, such as visiting speakers and our Road Trip Series.

Please consult the American Studies program website for detailed descriptions of courses. For all 1111, special topic, and independent study courses, the course must be on an American topic, as approved by the director of the American Studies program. Note: 1111 in all departments receives credit when an American topic is offered.

### *Approved List of Courses*

#### **AREA A: HUMANITIES**

ART: 1099, Maymester Contemporary Art Blitz (when U.S. city/art).

CLASSICAL STUDIES: 3000, Classical Tradition in America.

COMMUNICATION STUDIES: 2800, Rhetoric and Civic Life; 3000, Rhetoric of the American Experience, 1640–1865; 3001, Rhetoric of the American Experience, 1865 to 1945; 3100, Rhetoric of Social Movements; 3002, Rhetoric of the American Experience, 1945–Present; 3110, Women, Rhetoric, and Social Change; 3720, Communicating Gender; 2950, Rhetoric of Mass Media; 3700, Politics and Mass Media; 3890, Selected Topics in Communication Studies; 4940–4941, Seminars in Selected Topics.

ENGLISH: 2316, 2316W, Representative American Writers; 2320, Southern Literature; 3624W, Literature of the American Civil War; 3710–3711, Literature and Intellectual History (when an American topic is offered); 3644–3645, Twentieth-Century American Novel; 3640, Modern British and American Poetry; Yeats to Auden; 3646, Poetry since World War II; 3622, Nineteenth-Century American Women Writers; 3654, 3654W, African

American Literature; 3642, Film and Modernism; 3620, Nineteenth-Century American Literature; 3692, Desire in America: Literature, Cinema, and History; 3694, America on Film: Art and Ideology; 3695, America on Film: Performance and Culture; 3899, Special Topics in Film; 3674, Caribbean Literature; 3890, 3890W, Movements in Literature (when an American topic is offered); 3892, 3892W, Problems in Literature (when an American topic is offered); 3894, 3894W, Major Figures in Literature; 3658, Latino-American Literature; 3662, 3662W, Asian American Literature; 3650, 3650W, Ethnic American Literature; 3746, Workshop in English and History; 3644, Jewish American Literature; 3680–3681, Twentieth-Century Drama; 3896, Special Topics in Investigative Writing in America; 3898, 3898W, Special Topics in English and American Literature (when an American topic is offered).

HISTORY OF ART: 2720, Modern Architecture; 3735, History of Photography; 2660, American Art to 1865; 2760, Early American Modernism, 1865–1945; 2765, Art since 1945; 4960, Advanced Seminar (when an American topic is offered).

MUSIC LITERATURE AND HISTORY: 1610, Musical Theatre in America: A Cultural History; 2600, American Music; 1620, Survey of Jazz; 1600, American Popular Music; 1630, The Blues; 1640, Country Music; 1650, History of Rock Music; 2150, Music, Identity, and Diversity; 2610, Music of the South; 2320, Exploring the Film Soundtrack.

OTHER MUSIC COURSES: 1300, Music and the Fall of Segregation.

PHILOSOPHY: 2110, Contemporary Philosophy; 3008, American Philosophy; 2104, Nineteenth-Century Philosophy; 3603, Philosophy of Education; 3623, Modern Philosophies of Law.

RELIGIOUS STUDIES: 1100, Introduction to African American Religious Traditions; 1190W, Introduction to Southern Religion and Culture; 3304W, Evangelical Protestantism and the Culture Wars; 3119, Martin Luther King, Jr., and the Social Roles of Religion; 3142, Slave Thought and Culture in the American South.

SPANISH AND PORTUGUESE: 3375, Film and Culture in Latin America; 3835, Latino Immigration Experience; 4750, Afro-Hispanic Literature.

THEATRE: 1811, Marshals, Mobsters, Monsters, Magnums, and Musicals: American Movie Genres; 2204, Histories of Theatre and Drama III: The U.S. Stage.

#### **AREA B: SOCIAL SCIENCES**

ANTHROPOLOGY: 2105, Race in the Americas.

ECONOMICS: 2100, Labor Economics; 2150, Economic History of the United States; 2890, Special Topics; 3100, Wages, Employment, and Labor Markets; 3150, Topics in the Economic History of the U.S.

HISTORY: 1390, America to 1776: Discovery to Revolution; 1400, U.S. 1776–1877: Revolution to Civil War and Reconstruction; 1410, U.S. 1877–1945: Reconstruction through World War II; 1420, U.S. Post-1945: Cold War to the Present; 1440, African American History since 1877; 1650, The Foreign Expansion of American Banking; 1660, American Enterprise; 1690, Sea Power in History; 1730, The U.S. and the Cold War; 1740, The U.S. and the Vietnam War; 2840, Sexuality and Gender in the Western Tradition since 1700; 3010, Pornography and Prostitution in History; 2535, Latin America and the United States; 2580, American Indian History before 1850; 2590, American Indian History since 1850; 2610, The Founding Generation; 2620, The Old South; 2630, The New South; 2640, Appalachia; 2690, The Civil Rights Movement; 2700, The U.S. and the World; 2710, The U.S. as a World Power; 2721, Globalizing American History, 1877–1929; 2730, American Masculinities; 2750, American Intellectual History since 1865; 2800, Modern Medicine; 2810, Women, Health, and Sexuality; 3040, Health and the African American Experience; 3080, U.S. and Caribbean Encounters; 3140, History of New Orleans; 3160, Immigration, Race, and Nationality: The American Experience; 3170, The Federalist Papers; 3250W, Blacks and Money; 3746, Workshop in English and History; 3890, Selected Topics in History (when an American topic is offered); 4960, Majors Seminar (when an American topic is offered).



**POLITICAL SCIENCE:** 1100, Introduction to American Government and Politics; 1150, U.S. Elections; 2222, American Foreign Policy; 2240, Political Parties; 3241, American Public Opinion and Voting Behavior; 2243, Political Campaigns and the Electoral Process; 3244, The Legislative Process; 2245, The American Presidency; 3247, American Political Culture; 3249, American Political Thought; 3250, Group Conflict and Cooperation in U.S. Politics; 2255, Public Policy Problems; 3260, Introduction to American Law; 2262, The Judicial Process; 2263, Religion and Politics; 2265, Constitutional Law: Powers and Structures of Government; 2266, Constitutional Law: Civil Liberties and Rights; 3272W, The War in Iraq, 2003–2011; 3891, Topics in Contemporary Politics; 3893, Selected Topics of American Government; 3897, Selected Topics (when an American topic is offered).

**SOCIOLOGY:** 3601, Self, Society, and Social Change; 3602, Change and Social Movements in the Sixties; 3204, Tourism, Culture, and Place; 3611, Women and the Law; 3603, Women and Social Activism; 3201, Cultural Consumption and Audiences; 3221, The Family; 3621, Criminology; 3622, Delinquency and Juvenile Justice; 3624, Prison Life; 3233, Contemporary American Society; 3301, Society and Medicine; 3222, Sociology of Religion; 3207, Popular Culture Dynamics; 3604, American Social Movements; 3722, Gender in Society; 3616, Women and Public Policy in America; 3223, Schools and Society: The Sociology of Education; 3702, Racial and Ethnic Minorities in the United States; 3724, Gender Identities, Interactions, and Relationships; 3322, Immigration in America; 4961, Seminars in Selected Topics (when an American topic is offered).

### AREA C: INTERDISCIPLINARY PROGRAMS

**AFRICAN AMERICAN AND DIASPORA STUDIES:** 1010, Introduction to African American and Diaspora Studies; 1016, Race Matters; 3206, Mystery, Murder, and Mayhem in Black Detective Fiction; 3104W, Soul Food as Text in Text: An Examination of African American Foodways; 3214, Black Masculinity: Social Imagery and Public Policy; 3258, Black Issues in Education.

**AMERICAN STUDIES:** 1002, 1002W, Introduction to American Studies; 1111, First-Year Writing Seminar; 3200, Global Perspectives on the U.S.; 3890, Topics in American Studies; 3881, Internship Readings and Research; 3851, Independent Readings and Research; 3852, Independent Readings and Research; 4000, The American Studies Workshop; 4100, Undergraduate Seminar in American Studies; 4960, Senior Project; 4998, Senior Honors Research; 4999, Senior Honors Thesis.

**CINEMA AND MEDIA ARTS:** 1600, Introduction to Film and Media Studies.

**JEWISH STUDIES:** 2280/2280W, Jewish Humor; 2420W, American Jewish Music; 2400, American Jewish Life; 2560, Social Movements in Modern Jewish Life; 3830, Contemporary Jewish Issues.

**LATIN AMERICAN STUDIES:** 2601, Latin America, Latinos, and the United States.

**MEDICINE, HEALTH, AND SOCIETY:** 1930, Fundamental Issues in Medicine, Health, and Society; 3020, U.S. Public Health Ethics and Policy; 3150, Death and Dying in America; 3890, Special Topics.

**WOMEN'S AND GENDER STUDIES:** 2243, Sociologies of Men and Masculinity; 3246W, Women's Rights, Women's Wrongs; 2248, Humor and Cultural Critique in Fannie Flagg's Novels; 2249, Women and Humor in the Age of Television; 3250/3250W, Contemporary Women's Movements; 2259/2259W, Reading and Writing Lives; 2268, Gender, Race, Justice, and the Environment; 3271, Feminist Legal Theory; 3891, Special Topics: Topics in Gender, Culture, and Representation; 3893, Selected Topics (when an American topic is offered).

**Course descriptions begin on page 137.**

# Anthropology

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SENIOR LECTURERS Mareike Sattler, Jeffrey Shenton, Anna Catesby

Yant

LECTURERS Sophie Bjork-James, Kasia Szremski

**ANTHROPOLOGY** is the study of human diversity in all times and places. It brings together perspectives from the sciences and humanities, and from non-Western as well as Western societies, to illuminate different aspects of the human past, the human body, and contemporary social life. Global perspectives, fieldwork and experiential learning, and concerns with ethics, justice, and social well-being are hallmarks of anthropology. Vanderbilt's program has a strong research focus on Latin America and historically marginalized groups, especially indigenous people and descendants of the African diaspora.

Students majoring in anthropology take courses in several subfields, each of which looks at humanity from a different perspective. Cultural anthropology examines the relationships, beliefs, values, and political-economic practices that shape individual behavior, community life, and power in society. Archaeology studies past cultures through their material remains. Linguistics explores relations between language and culture. Biological anthropology examines topics such as human evolution, genetics, and human biology. Courses cluster around themes of cross-cultural health, biology, food, and medical systems; inequality, power, and social-political relations; material culture, human-environment relations, and spatial analysis; religion and politics; and worldviews, language, and cognition. Unless indicated otherwise in the course description, anthropology courses have no prerequisites and are open to all majors and non-majors.

Knowledge of the diversity of human histories and lifeways is vital to imagining alternative paths to a better society. Anthropology develops this knowledge through experiential learning that challenges students to go beyond the familiar, to see, understand, and create in new ways. This preparation is useful in all professional careers that involve understanding human behavior, working with people from different backgrounds, analyzing complex information, and thinking holistically.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Anthropology*

The major in anthropology requires completion of at least 30 credit hours of course work, as follows:

1. At least three 1000-level surveys (chosen from Anthropology 1101, 1201, 1301, 1601) covering the four subfields of anthropology: cultural anthropology, biological anthropology, archaeology, and linguistic anthropology.

2. A minimum of three credit hours from each of the groups below:

*Group I—Comparative Anthropology and Anthropological Theory:* 2105, 2220, 2220W, 2370, 3121, 3122, 3132, 3133, 3140, 3141, 3142, 3143, 3145, 3150, 3150W, 3160, 3262, 3900, 3901, 4152, 4153, 4154, 4155

*Group II—Archaeology and Biological Anthropology:* 2211, 2230, 2231, 2342, 3130, 3161, 3162, 3200, 3201, 3202, 3240, 3242, 3243, 3243W, 3250, 3260, 3261, 3343, 3344, 3371, 3372, 3620, 3620W, 3866, 4345, 4373

*Group III—Ethnography, Ethnohistory, and Linguistics:* 2106, 2107, 2108, 2109, 2223, 2227, 2250, 2601, 2602, 2603, 2614, 3120, 3130, 3134, 3144, 3161, 3241, 3614, 3622

3. A seminar on anthropological theory (3900 or 3901). The seminar may not also be used to count toward Group I credit above.
4. At least 18 credit hours must be at the 2000 level or higher.
5. The remainder of the credit hours must be chosen from ANTH courses not already used to satisfy the requirements listed above.
6. With the approval of the student's major adviser, a maximum of 3 credit hours for a course taken in another department or program may be counted toward the major requirement. A variety of courses are possible, including but not limited to those listed below. In each case, the course must be relevant to the student's program and the student must receive the approval of the director of undergraduate studies.
  - African American and Diaspora Studies 2178, 3178; Biological Sciences 2205; History 1270, 2490; History of Art 2210; Latin American Studies 2301, 2601; Mathematics 1010, 1011; Medicine, Health, and Society 1930, 2130, 2240, 2250, 2420, 2430, 3010, 3020, 3110, 3140, 3150, 3210, 3212, 3220, 3250; Music Literature 1100, 1105, 2110; Religious Studies 4554; Sociology 3001, 3221, 3232, 3311, 3313, 3314; Spanish 3360.

### Honors Program

The Honors Program in Anthropology is designed to afford superior students the opportunity to pursue more intensive work within the major field. Students who want to do honors work in anthropology should contact the director of the Honors Program in the fall of their junior year. The completion of the Honors Program requires: a) 4–5 credit hours in Anthropology 4998 (Honors Research), evaluated by honors thesis adviser, b) 4–5 credit hours in Anthropology 4999 (Honors Thesis), evaluated by honors thesis adviser, c) submission of a written thesis, evaluated by the student's honors committee, d) an oral presentation of the thesis (15–20) minutes, evaluated by the student's honors committee, e) an oral examination of the thesis, administered by the student's honors committee. The Honors Research- and Honors Thesis-hours are expected to be

in excess of the 30 credit hours required for the anthropology major.

### Minor in Anthropology

The minor in anthropology requires 18 credit hours of course work that includes any two of the introductory courses: ANTH 1101, 1301, 1201, 1601; one course listed in Group I in the major; and three additional courses from any combination of the courses listed in Group I, II, and III in the major.

**Course descriptions begin on page 138.**

## Arabic

SENIOR LECTURERS M. Issam Eido, Bushra Hamad

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 142.**

## Art

CHAIR Mel Ziegler  
 DIRECTOR OF UNDERGRADUATE STUDIES Vesna Pavlovic  
 PROFESSOR EMERITUS Michael Aurbach  
 PROFESSORS Marilyn L. Murphy, Mel Ziegler  
 ASSOCIATE PROFESSORS Mark Hosford, Vesna Pavlovic  
 ASSISTANT PROFESSOR Jonathan Rattner  
 ASSOCIATE PROFESSOR OF THE PRACTICE Jana Harper  
 PRINCIPAL SENIOR LECTURER Susan DeMay  
 SENIOR LECTURER Farrar Hood Cusomato  
 LECTURER John Warren

Affiliated Faculty  
 PROFESSOR David Wood (Philosophy)

COURSES in art are offered in a variety of media, which provide wide-ranging methods and perspectives. Our courses emphasize creative and critical approaches to learning.

Many students will use the program in art as a foundation for careers in which creativity and the visual are especially valued, as the basis for advanced training in professional schools (such as art, architecture, museum studies), and for employment in galleries, museums, commercial art, or design-related fields. An important goal of the department is to help students become readers of the rich visual environment in our culture throughout their lives, as well as to encourage creative approaches to learning in all disciplines.

The Department of Art offers several opportunities for extracurricular activities in the arts. Recently a student-run art gallery opened. A new art club called Viral Student Group has

begun. BLUEprint is an organization for students interested in entering the field of architecture. Our Space 204 arts laboratory has exhibitions and workshops all year long. Studio VU lecture series brings some of the most important artists working today to campus for lectures and one-on-one studio visits with students.

There are several campus organizations in the arts. The Sarratt Visual Arts Committee allows students to have a hand in curating and hanging exhibitions, as well as hosting art openings at the Sarratt Gallery. Visions sponsors lectures and discussions about the history of art as well as a roundtable of alumni majors, who discuss their current careers and how they arrived at them.

Since 1984 the department has supervised the awarding of the Margaret Stonewall Wooldridge Hamblet Award to an eligible senior student. The Hamblet Award provides the means for travel and independent art activity for one year, culminating in a one-person exhibition at Vanderbilt. Students wanting to participate in the spring competition must be graduating seniors who are studio art majors.

The Allan P. DeLoach Memorial Prize in Photography was established in 2000 in memory of Allan DeLoach (B.A. 1963) by two of his colleagues at IBM. This cash award is open to any student who has taken a studio class in any discipline at Vanderbilt. Midsouth Ceramics awards are given to the top three ceramic projects in the annual open house, and the recently established Plaza Artists Materials award is given to four students each year. All competitions are judged by outside professional artists.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Art*

The art major requires 36 credit hours and presents our students the opportunity to explore their ideas conceptually, as well as to learn the technical skills involved in the creation of art. The program offers a wide range of classes and media. Our students are offered a strong grounding in traditional processes such as drawing, painting, ceramics, and sculpture, as well as the opportunity to explore contemporary processes involving video, performance, digital photographic media, installation, and social interactive art practice. Our diverse faculty of artist/educators represents a wide range of teaching styles and aesthetic philosophies. We consider how ideas have been developed through the centuries as well as how specific techniques have been used to enrich the expression of the idea. In addition to modern art history offerings, art majors are encouraged to take courses in pre-Renaissance, non-Western art history, philosophy of aesthetics, and film. The Contemporary Art Maymester offers an opportunity to study contemporary art in a concentrated manner.

### *Requirements for the Program of Concentration in Art*

Foundation Requirement (6 credit hours)

- 1101 and 1102

Studio Requirements (15 credit hours), which must include at least:

- One 2-D course (ARTS 1600, 1601, 1503, 1200, 1201, 1202, 1300, 2100, 2101, 2102, 2600, 3600, 2200, 3200, 2202, 2300, 3101, 3102, 3300)
- One 3-D course (ARTS 1400, 1401, 1500, 1501, 1502, 2400, 2401, 2500)
- One time-based course (ARTS 1700, 1701, 1702, 2700, 2701, 2702)

Within the 15 credit hours, students must take at least one 2000-level or higher ARTS course.

Related Requirement (9 credit hours), which must include one course (3 credit hours) of each of the following:

- Either HART 1100 or 1105 (suggested for entry into 2000-level HART courses)
- ARTS 1800
- 2000-level HART course or one course from the following: ARTS 1099, 3891, CMA 1600, 2300, PHIL 3014

Department highly recommends taking ARTS 1800 Sources of Contemporary Art course prior to senior year.

Directed Study (6 credit hours)

- 3970, Directed Study: Senior Show and Contemporary Practices
- 3971, Independent Research: Senior Show

Majors are required to complete the Independent Research course, ARTS 3971, their senior year. This course is designed specifically to help prepare majors for their Senior Show, and is typically taken in the second semester of the senior year. No other independent research/study course may be counted toward the major.

### *Honors Program in Art*

The Honors Program in the Department of Art offers excellent art majors the opportunity to pursue their interest at a higher level. To be admitted to the Honors Program in Art, students must have:

- At least a 3.30 cumulative GPA.
- At least a 3.5 GPA in courses that count toward the major in art.
- Completed the sophomore year.

Students interested in pursuing the honors program should contact the director of undergraduate studies. Application materials must be submitted to the director of undergraduate studies in the applicant's junior year; applications may be submitted electronically. Applications must include ten digital images of recent work with written explanations of each image. Applicants will be notified in writing of the department's decision.

Each honors student shall have a committee consisting of one faculty member appointed by the department chair, the student's selected honors adviser, and the director of undergraduate studies.

Requirements for graduation with honors in art:

1. Successful completion of the requirements for the major in art.

2. During the senior year the student is required to register for ARTS 4998 (3 credit hours) in the first semester and 4999 (3 credit hours) in the second semester in order to complete a written thesis, expanding concepts explored in the senior exhibition.
3. Successful oral defense of the thesis and senior exhibition during the final semester of undergraduate study.
4. At least a final 3.30 cumulative GPA.
5. At least a final 3.5 GPA in courses that count toward the major in art.

### *Minor in Art*

The minor in art requires 18 credit hours of course work, including the following:

- HART 1105 or ARTS 1800;
- ARTS 1102 (Drawing and Composition I); and four other ARTS courses, with at least one at the 2000-or-higher level.

**Course descriptions begin on page 142.**

## *Asian Studies*

DIRECTOR Gerald Figal

PROFESSORS Robert Company, Gerald Figal (History), Tony K. Stewart (Religious Studies)

ASSOCIATE PROFESSORS Tracy Miller (History of Art), Samira Sheikh (History), Lijun Song (Sociology)

ASSISTANT PROFESSORS Ben Tran, Guojun Wang

SENIOR LECTURERS Xianmin Liu, Michiru Lowe, Elliott McCarter, Keiko Nakajima

LECTURERS Yinghui Guo, Jing Liu, Qing Wei

Affiliated Faculty

PROFESSOR Yoshikuni Igarashi (History)

ASSOCIATE PROFESSORS Brett Benson (Political Science), Ruth Rogaski (History), Tariq Thachil (Political Science)

ASSISTANT PROFESSORS Nancy Lin (Religious Studies), Peter Lorge (History), Bryan Lowe (Religious Studies), Akshya Saxena (English), Haerin Shin (English), Anand V. Taneja (Religious Studies)

SENIOR LECTURER EMERITUS James Auer (Center for U.S.–Japan Studies)

THE Asian Studies program provides students with a foundation in the languages and cultures of Asia necessary to pursue a career within the rapidly developing marketplace that is Asia or to go on to graduate study in an Asia-related subject. With the intensive study of modern Asian languages at its core, the program embraces a wide variety of courses in the art, culture, economics, history, film and media, politics, religion, and sociology of East Asia, South Asia, and Southeast Asia. Through their teaching and research, the affiliated faculty members promote a better understanding of multiple facets of life in Asia and the region's relationship with the rest of the world, past and present.

Majors and minors are strongly encouraged to complete a study abroad program in Asia. Up to 6 credit hours of Asia-related courses from Vanderbilt-approved study abroad programs may be applied toward the major or minor upon approval of the director of the Asian Studies program or director of undergraduate studies. Students should consult with the director or DUS before applying to a study abroad program.

### *Program of Concentration in Asian Studies*

The major in Asian studies requires a minimum of 36 credit hours of course work and is designed to ensure that graduates have both depth and breadth in their understanding of Asia.

For the major in Asian studies, students must formally declare an area of concentration at the time the major is declared (China or Japan) and complete at least 36 credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in an Asian language taught in the Asian Studies program at the 3301 (Advanced I) level or above. Asian languages not offered by the Asian Studies program require the approval of the Asian Studies program director or the director of undergraduate studies.
2. At least 9 non-language credit hours of courses in area of concentration.
3. At least 6 non-language credit hours of courses eligible for Asian Perspectives.
4. Up to 18 credit hours of courses in any Asian language offered by the Asian Studies program may be applied to the total 36 credit hours.

Advanced Placement credits in language do not count toward credit hours required for the major or minors, but can figure into the assessment of initial placement within a language track.

### *Honors Program in Asian Studies*

In addition to following the requirements set by the College of Arts and Science, the following must be satisfied:

1. All of the requirements for the major in Asian studies.
2. 3 credit hours of ASIA 3980 Juniors Honors Readings. If ASIA 3980 is not offered, this requirement may be substituted by an alternative course, with approval by the Asian Studies program director or the director of undergraduate studies.
3. ASIA 4998 (3 credit hours) and 4999 (3 credit hours). Honors Research must be taken while in residence at Vanderbilt. The candidate will write an honors thesis while completing the two-semester Honors Research sequence. The honors thesis is a research paper on a topic defined by the student in consultation with the faculty adviser and approved in advance by the Honors Committee (see below for definition of Honors Committee).  
*Note:* 3980, 4998, and 4999 may count toward the 36 credit hours required for the major.
4. A minimum 3.30 cumulative grade point average with a minimum 3.50 grade point average in courses that count toward the major in Asian studies upon completion of the Honors requirements.
5. An oral examination on the thesis typically scheduled within the two months prior to graduation.

Study abroad in a country relevant to the Honors Research project is strongly recommended.

A three-member Honors Committee of Asian Studies faculty administers the Honors Program. The committee will set guidelines for the thesis topic proposal, publish deadlines each year, and administer the oral examination. Students submit the name of the faculty adviser and the proposed thesis topic to this committee for approval early in the second semester of the

junior year. If the student is studying abroad that semester, the proposed thesis topic should be submitted in the first semester of the junior year or arrangements should be made to submit the thesis topic from abroad during the second semester of the junior year.

### *Minor in Asian Studies*

The minor in the Asian Studies program provides a broad knowledge of the languages, literatures, politics, histories, film and media, arts, and religions of China and Japan. Students cannot combine the Asian studies minor with other minors within the Program in Asian Studies.

For the minor in Asian studies, students must complete at least 17 credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 5 credit hours in any Asian languages taught in the Asian Studies program at the 2201 (Intermediate I) level or above
2. At least 6 credit hours of History Survey Courses
3. At least 3 credit hours of Humanities Courses
4. At least 3 credit hours of Social Sciences Courses
5. Up to 5 credit hours of any Asian language courses taught in the Asian Studies program may be applied to the total 17 credit hours

### *Minor in Chinese Language and Culture*

The minor in Chinese language and culture is anchored by a firm foundation in language study that is complemented by electives in art, history, literature, film and media, politics, and religion. Students cannot combine the Chinese language and culture minor with other minors within the Asian Studies program.

For the minor in Chinese language and culture, students must complete at least 18 total credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in Chinese language at the 3301 (Advanced I) level or above
2. At least 15 credit hours of courses from China Concentration
3. Up to 13 credit hours of Chinese language courses may be applied to the total 18 credit hours

### *Minor in Japanese Language and Culture*

The minor in Japanese language and culture is anchored by a firm foundation in language study that is complemented by electives in art, history, literature, film and media, politics, and religion. Students cannot combine the Japanese language and culture minor with other minors within the Asian Studies program.

For the minor in Japanese language and culture, students must complete at least 18 total credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in Japanese language at the 3301 (Advanced I) level or above
2. At least 15 credit hours of courses from Japan Concentration
3. Up to 13 credit hours of Japanese language courses may be applied to the total 18 credit hours

## Asian Studies Course List

All courses on this list count toward the credit-hour requirements for the major and the minors within the Asian Studies program. Their eligibility for specific requirements within the major and minors is indicated by the following codes:

China Concentration = CC

Japan Concentration = JC

Asian Perspectives = AP

History Survey Course = HS

Humanities Course = HU

Social Science Course = SS

Any given course may be applied to only one category of requirement even if it may be eligible for more than one. Courses marked with an \* require approval from the Asian Studies program director or director of undergraduate studies.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Chinese Language Courses

CHIN 1011. Basic Chinese (CC)

CHIN 1012. Basic Chinese (CC)

CHIN 1101. Elementary Chinese I (CC)

CHIN 1102. Elementary Chinese II (CC)

CHIN 1231. Calligraphy (CC, HU)

CHIN 2201. Intermediate Chinese I (CC)

CHIN 2202. Intermediate Chinese II (CC)

CHIN 2211. Chinese for Heritage Learners I (CC)

CHIN 2212. Chinese for Heritage Learners II (CC)

CHIN 3301. Advanced Chinese I (CC)

CHIN 3302. Advanced Chinese II (CC)

CHIN 3302W. Advanced Chinese II (CC)

CHIN 3851. Independent Study (CC)\*

CHIN 3852. Independent Study (CC)\*

CHIN 4401. Business Chinese I (CC)

CHIN 4402. Business Chinese II (CC)

CHIN 4403. Readings in Modern Chinese Media (CC)

CHIN 4404. Readings in Modern Chinese Media (CC)

CHIN 4405. Classical Chinese Literature and Philosophy. (CC, HU)

CHIN 4406. Readings in Modern Literary Chinese (CC, HU)

### Hindi-Urdu Language Courses

HNUR 1101. Elementary Hindi-Urdu I

HNUR 2201. Intermediate Hindi-Urdu I

### Japanese Language Courses

JAPN 1011. Basic Japanese I (JC)

JAPN 1012. Basic Japanese II (JC)

JAPN 1101. Elementary Japanese I (JC)

JAPN 1102. Elementary Japanese II (JC)

JAPN 2201. Intermediate Japanese I (JC)

JAPN 2202. Intermediate Japanese II (JC)

JAPN 2232. Japanese through Manga (JC)

JAPN 3301. Advanced Japanese I (JC)

JAPN 3302. Advanced Japanese II (JC)

JAPN 3851. Independent Study (JC)\*

JAPN 3852. Independent Study (JC)\*

JAPN 3891. Special Topics in Advanced Japanese (JC)

### Asian Studies

ASIA 1111. First-Year Writing Seminar\*

ASIA 1201. Writing Southeast Asia (AP, HU)

ASIA 1680. Inside China (CC, SS)

ASIA 2100W. Fashioning the Self: Coming of Age and Asian Modernities (AP, HU)

ASIA 2210W. Hollywood Hanoi (HU)

ASIA 2511. Popular Culture in Modern Japan (JC, HU)

ASIA 2512. Explorations of Japanese Animation (JC, HU)

ASIA 2513W. Media Monsters in Contemporary Japan (JC, HU)

ASIA 2560. Current Japan–U.S. Relations (JC, SS)  
 ASIA 2605. Romancing the Nation in Modern Chinese Literature (CC, HU)  
 ASIA 2606. Martial Tradition in Chinese Literature (CC, HU)  
 ASIA 2607. Self and Society in Pre-modern Chinese Literature (CC, HU)  
 ASIA 2608. Chinese Drama: 13th to 20th Centuries (CC, HU)  
 ASIA 2609W. Writing and Gender in Traditional China (CC, HU)  
 ASIA 2630. Chinese Medicine (CC, SS)  
 ASIA 3151. The Third World and Literature (AP, HU)  
 ASIA 3633. Self-Cultivation in Ancient China (CC, HU)  
 ASIA 3851. Independent Study\*  
 ASIA 3852. Independent Study\*  
 ASIA 3891. Special Topics\*  
 ASIA 3892. Special Topics\*  
 ASIA 3980. Junior Honors Readings\*  
 ASIA 4998. Honors Research\*  
 ASIA 4999. Honors Research\*

### History

HIST 1050. East Asia since 1800 (AP, HS)  
 HIST 1060. Premodern China (CC, HS)  
 HIST 1070. China from Empire to the People's Republic (CC, HS)  
 HIST 1080. Premodern Japan (JC, HS)  
 HIST 1090. Modern Japan (JC, HS)  
 HIST 1160. Modern South Asia (HS)  
 HIST 1881. The Body in Modern Japanese Culture (JC, HU)  
 HIST 1882W. Japan: Historical Fiction (JC, HU)  
 HIST 2100. Themes in Modern Chinese History, 1966–1989 (CC, SS)  
 HIST 2105. Chinese Thought (CC, HU)  
 HIST 2110. Crisis Simulation in East Asia (AP, SS)  
 HIST 2111. U.S.–Asia Relations (AP, SS)  
 HIST 2115. Play and Pleasure in Early Modern Japan (JC, HU)  
 HIST 2119. The Pacific War in Cinematic Memory (JC, HU)  
 HIST 2120. Post-WWII Japan (JC, SS)  
 HIST 2140. The Mughal World (AP, SS)  
 HIST 2145. Religion and Politics in South Asia (AP, SS)  
 HIST 2150. India and the Indian Ocean (AP, SS)  
 HIST 3090. Tokyo: History and Image (JC, SS)  
 HIST 3110. Christianity in China (JC, SS)  
 HIST 3220W. Images of India (HU)

### History of Art

HART 1200. Arts of East Asia (AP, HU)  
 HART 1205. Arts of South and Southeast Asia (AP, HU)  
 HART 1220. History of Asian Architecture (AP, HU)  
 HART 2110. Arts of China (CC, HU)  
 HART 2130. Arts of Japan (JC, HU)  
 HART 2150. East Asian Architecture and Gardens (AP, HU)  
 HART 2170. Religion and Politics in South and Southeast Asian Art (AP, HU)  
 HART 3112. The Arts of China during the Liao-Song Period (CC, HU)  
 HART 3164W. Art of Buddhist Relic and Reliquary (AP, HU)

### Human and Organizational Development

HODI 3260. Education in the Asia-Pacific Region: Development, Reform, and Innovation (AP, SS)

### Medicine, Health, and Society

MHS 2310. Chinese Society and Medicine (CC, SS)

### Political Science

PSCI 2216. The Chinese Political System (CC, SS)

### Religious Studies

RLST 1500. Introduction to Islam (AP, HU)  
 RLST 1637. Religions of Tibet and the Himalaya (AP, HU)  
 RLST 1700. Religions in China (CC, HU)  
 RLST 1710. Religions of Japan (JC, HU)  
 RLST 2644. Buddhist Traditions (AP, HU)  
 RLST 2664. Foundations of Hindu Traditions (AP, HU)  
 RLST 3561. Islam in South Asia (HU)  
 RLST 3650. Classical Philosophies of India (HU)  
 RLST 3669. Sacred Space in the Tibetan World (AP, HU)  
 RLST 3670W. Buddhism and the State (AP, HU)  
 RLST 3747. Daoist Tradition (AP, HU)

RLST 3749. Zen Buddhism (AP, HU)  
 RLST 3753. East Asian Buddhism (AP, HU)  
 RLST 3775. Chinese Religions through Stories (CC, HU)  
 RLST 4552. Islam in the Modern World (AP, HU)  
 RLST 4665. Mythologies and Epics of South Asia (HU)  
 RLST 4666. Devotional Traditions of South Asia: Hindu, Muslim, Sikh (AP, HU)  
 RLST 4774. Japanese Mythology (JC, HU)

## Asian Studies

**Course descriptions begin on page 143.**

## Chinese

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 149.**

## Japanese

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 178.**

# Biochemistry and Chemical Biology

DIRECTORS Brian O. Bachman, Brandt F. Eichman  
 DIRECTOR OF UNDERGRADUATE STUDIES Michelle Sulikowski

### Advisory Committee

PROFESSORS Lawrence J. Marnett (Chemistry), Douglas G. McMahon (Biological Sciences), David Cliffler (Chemistry), David W. Wright (Chemistry), John York (Biochemistry)

ASSOCIATE PROFESSOR Bruce M. Damon (Radiology and Radiological Sciences)

ASSISTANT PROFESSOR Lauren Parker Jackson (Biological Sciences)  
 SENIOR LECTURER Cynthia T. Brame (Biological Sciences)

THE study of chemical processes within living systems is an interdisciplinary enterprise that spans the fields of chemistry, molecular and cellular biology, biophysics, and engineering. Chemical biology and biochemistry use chemical insight, techniques, and tools to study or manipulate biological systems. They are the cornerstones of medical technology and therapeutics. To provide students with training in modern principles

at a chemistry-biology interface, Vanderbilt's interdisciplinary major in biochemistry and chemical biology incorporates expertise from multiple departments in the university. Students receive a broad background in the natural sciences (chemistry, biology, physics) and mathematics, followed by fundamental core training in principles of biochemistry and chemical biology that involves both theoretical and laboratory course work. Students then pursue an area of emphasis in either biochemistry or chemical biology through upper-level elective courses. Students participate in independent research in laboratories of biochemistry and chemical biology faculty. Additional research experience is available in the Honors Program.

### *Program of Concentration*

The biochemistry and chemical biology major tracks share fundamental core elements but have a distinct set of foundational courses, track-specific electives, and laboratory requirements. All students are required to complete a set of basic science and mathematics courses. The major consists of 32 credit hours beyond these basic science and mathematics courses. All students complete 12 credit hours of core courses, 14 credit hours of either biochemistry or chemical biology track, and 6 credit hours of general electives. For suggested paths of completion, see the Biochemistry and Chemical Biology program website.

### **Required Math and Science Courses for Both Tracks**

(38 credit hours)

- Biological Sciences — BSCI 1510, 1511, 1510L, and either 1511L or 1512L
- Chemistry — CHEM 2221 or 2211; CHEM 2222 or 2212; and CHEM 2221L and 2222L
- Mathematics — MATH 1200 or 1300 and MATH 1201 or 1301
- Physics — PHYS 1501 or 1601; PHYS 1502 or 1602; PHYS 1501L or 1601L; and PHYS 1502L or 1602L

*Note: These credit hours do not count toward the major. AP credit may satisfy some of these requirements.*

### **Fundamental Core Courses for all Tracks (12 credit hours)**

BSCI 2520; CHEM 3710; CHEM 3310; CHEM 4965

### **Tracks (14 credit hours)**

#### **Biochemistry Track**

- Biochemistry Foundations (3 credit hours) — BSCI 4265
- Biochemistry Electives (9 credit hours) — BCB 4320, BSCI 2201, BSCI 2210, CHEM 2100, CHEM 4720
- Laboratory (2 credit hours) — BCB 3201

#### **Chemical Biology Track**

- Chemical Biology Foundations (5 credit hours) — CHEM 2100 and 2100L; BCB 2101
- Chemical Biology Electives (6 credit hours) — BCB 4320, BSCI 4265, CHEM 4720
- Chemical Biology Laboratory (3 credit hours) — BCB 3201, CHEM 4966

### **General Electives (6 credit hours)**

- Electives may be chosen from any of the following:
- BCB 3101, 4320; BME 2200, 3000, 4400, 4410, 4500;
  - BSCI 2201, 2210, 3230, 3234, 3243, 3245, 3247, 3252, 3256, 3270, 4265, 4266, 4274; CHEM 2100, 3020, 3220, 3300,

3310, 4230, 4720, 4966; CS 1101, 1103, 2204; NSC 2201, 3260, 3269, 3274, 3891, 4961

Courses taken to fulfill Track requirements are not eligible for elective credit.

### *Honors Program*

Students in either Biochemistry or Chemical Biology track may apply to the Honors Program if they hold a minimum cumulative GPA of 3.3 and a GPA of at least 3.4 in courses that count toward the major at the start of their junior year. The purpose of the Honors Program is to provide students with an intensive independent research experience in a host laboratory. In addition to meeting the requirements of the BCB major, Honors candidates must complete two semesters (3 credit hours each semester) of Independent Research (BCB 3201). Upon entering the program at the start of the junior year, candidates assemble a committee of the major research adviser and two additional faculty members appropriate to the area of research. As part of the research course work, the candidate will write an honors thesis. At the end of the graduating semester, Honors candidates must submit a written thesis and give an oral defense of their research.

**Course descriptions begin on page 145.**

## *Biological Sciences*

CHAIR Douglas G. McMahon  
 DIRECTOR OF UNDERGRADUATE STUDIES Charles K. Singleton  
 DIRECTOR OF GRADUATE STUDIES Donna J. Webb  
 PROFESSORS EMERITI Burton J. Bogitsh, Clint E. Carter, Robert Kral, Wallace M. LeStourgeon, David E. McCauley, Terry L. Page, Gerald J. Stubbs, Dean P. Whittier, Robley C. Williams Jr.  
 PROFESSORS Kendal S. Broadie, Kenneth C. Catania, Brandt F. Eichman, Todd R. Graham, Carl H. Johnson, Douglas G. McMahon, James G. Patton, Antonis Rokas, Charles K. Singleton, Laurence J. Zwiebel  
 ASSOCIATE PROFESSORS D. Kilpatrick Abbot, Seth R. Bordenstein, Katherine L. Friedman, Daniel J. Funk, Julian F. Hillyer, Donna J. Webb  
 ASSISTANT PROFESSORS John Anthony Capra, Nicole Creanza, Lauren Parker Jackson, Jared T. Nordman, Maulik R. Patel  
 SENIOR LECTURERS Steve J. Baskauf, Amanda R. Benson, Cynthia T. Brame, A. Denise Due-Goodwin, Mark A. Woelfle

THE biological sciences encompass the study of living organisms and life processes at all levels: ecosystems, populations, individual organisms, tissues, cells, subcellular structures, and molecules. The Department of Biological Sciences offers courses that address all of these levels and programs of study for undergraduates and for graduate students seeking the Ph.D.

For undergraduates, the department offers three majors and a minor. All three majors have honors tracks. The Biological Sciences (BioSci) major is designed for the student seeking a broad base in the biological sciences, though it is a highly flexible program that allows a certain amount of specialization in upper-level courses. The Molecular and Cellular Biology (MCB) major is designed for students with an interest in developing an in-depth understanding of how living systems function at the molecular and cellular levels, with upper-level course options ranging in content from biophysics and

biochemistry to developmental biology, and to molecular aspects of evolution and of toxicology. The Ecology, Evolution, and Organismal Biology (EEOB) major is designed for students with an interest in the areas of biology that span genomics, ecology, evolutionary biology, comparative genomics, organismal biology, and conservation biology. The department also offers a minor in biological sciences for students majoring in other disciplines. Interested students should consult the appropriate director of undergraduate studies.

The department offers undergraduates opportunities for engaging in faculty-led research projects for course credit. Students may receive an introduction to the workings of a scientific laboratory through an internship, or a more intensive, hands-on experience in directed or independent laboratory research. Students on the honors track of any of the three majors carry out a major honors research project and write an honors thesis. More information about the majors and minor offered by the department, the honors track of each major, and research opportunities open to undergraduates is available at our website: [as.vanderbilt.edu/biosci](http://as.vanderbilt.edu/biosci).

### General Requirements

All students in programs of concentration offered by the Department of Biological Sciences must take two semesters of general chemistry and lab (Chemistry 1601–1602 and 1601L–1602L) and two semesters of organic chemistry and lab (Chemistry 2221–2222 and 2221L–2222L). It is strongly recommended that students in all three majors take one year of calculus or calculus/statistics and one year of physics. A total of 30 hours of Biological Sciences courses, including the 8 hours of 1510–1511 and 1510L and either 1511L or 1512L, are required in all majors. All Biological Sciences courses count toward the major except 1100, 1105, and 1111. Below is a listing of the required courses for the Biological Sciences (BioSci) major, for the Molecular and Cellular Biology (MCB) major, and for the Ecology, Evolution, and Organismal Biology (EEOB) major. Students with specialized interests within either of the specialized majors may substitute one of the intermediate courses with an upper-level course with the permission of the director of undergraduate studies and the Biological Sciences Curriculum Committee. (Intermediate Biological Sciences courses: 2201, 2201L, 2205, 2210, 2210L, 2218, 2219, 2238, 2238L, 2520).

Students may declare only one of the majors offered by the Department of Biological Sciences; double or triple majors within the department are not permitted.

For honors in all three majors, additional requirements must be met: (a) normally a minimum GPA of 3.30 in courses that count toward the major; (b) at least 10 of the 30 hours of Biological Sciences course work must be directed/independent research with a minimum of 8 hours being honors research (BSCI 4999); (c) an honors thesis and oral defense. For students in the MCB major, 4265 or 4266 must be taken for 3 credit hours; an alternate advanced course may be substituted with the permission of the director of undergraduate studies. For students in the EEOB major, one of the following courses must be taken for 3 credit hours: 2238, 3230, 3234, 3247, 3270, 3272. For the BioSci major, at least two lecture courses must be from the following for 3 credit hours: 3230, 3234, 3236, 3243, 3245, 3247, 3252, 3254, 3256, 3270, 4265, 4266.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Biological Sciences (BioSci)

At least 30 credit hours satisfying the general requirements above, and including the following:

1. Introductory Courses: 1510/1510L and 1511/1511L or 1512L
2. Intermediate Courses:
  - a. 2205, 2210
  - b. one additional intermediate course: 2201, 2218, 2219, 2238, or 2520
3. Laboratory: Two laboratory courses (2201L, 2210L, 2218, 2219, or 2238L), or one lab course and two semesters of directed and/or independent research (BSCI 3861, 3961, 4999).
4. Seminar/Independent Studies: A minimum of 2 credit hours of 3850, 3861, 3961, 3965a–3965b, or 4999 is required. Only one seminar course (3965) may count toward the major. A total of no more than 6 credit hours of 3850, 3861, and 3961 may be counted toward the major.

For students intending to perform honors research, at least two lecture courses must be from the following: 3230, 3233, 3234, 3236, 3243, 3245, 3247, 3252, 3254, 3256, 3270, 3272, 4265, 4266.

### Program of Concentration in Molecular and Cellular Biology (MCB)

At least 30 credit hours satisfying the general requirements above, and including the following:

1. Introductory Courses: 1510/1510L, 1511/1511L or 1512L
2. Intermediate Courses: 2201, 2210, 2520 and either 2201L or 2210L
3. Laboratory: One additional laboratory course (2201L, 2210L, 2218, 2219, or 2238L), or two semesters of directed and/or independent research (BSCI 3861, 3961, 4999).
4. Seminar/Independent Studies: A minimum of 2 credit hours of 3850, 3861, 3961, 3965, or 4999 is required. Only one seminar course (3965a–3965b) may count toward the major. A total of no more than 6 credit hours of 3850, 3861, and 3961 may be counted toward the major.

Of the remaining courses, at least two must be from the following: 2205, 2243, 3230, 3234, 3236, 3245, 3247, 3252, 3256, 3270, 3272, 4265, 4299.

For students intending to perform honors research in the MCB major, 4265 or 4266 must be taken; an alternate advanced lecture course may be substituted with the permission of the director of undergraduate studies.

### Program of Concentration in Ecology, Evolution, and Organismal Biology (EEOB)

At least 30 credit hours satisfying the general requirements above, and including the following:

1. Introductory Courses: 1510/1510L and 1511/1511L or 1512L
2. Intermediate Courses: 2205 and 2210; and either 2218 or 2219 or 2238. If a student takes 2238 and neither 2218 nor 2219, then either 2210L or 2238L will be required as well.



- Laboratory: One additional laboratory course (2201L, 2210L, 2218, 2219, or 2238L), or two semesters of directed and/or independent research (BSCI 3861, 3961, 4999).
- Seminar/Independent Studies: A minimum of 2 credit hours of 3850, 3861, 3961, 3965a–3965b, or 4999 is required. Only one seminar course (3965) may count toward the major. A total of no more than 6 credit hours of 3850, 3861, and 3961 may be counted toward the major.

Of the remaining courses, at least two must be from the following: 3230, 3233, 3234, 3236, 3239, 3247, 3270, 3272, 4266; or 2218, 2219, or 2238 if not used for the intermediate course requirement.

For students intending to perform honors research in the EEOB major, one of the following courses must be taken: 3230, 3234, 3236, 3247, 3270, 3272.

### Minor in Biological Sciences

A minor in biological sciences requires a minimum of 18 hours that include BSCI 1510–1511b; 1510L and either 1511L or 1512L; 2210; and one other intermediate course. No more than two credit hours of 3860, 3861, 3850, and 3961 may be counted toward the minor.

Course descriptions begin on page 145.

## Chemistry

CHAIR David E. Cliffler  
 DIRECTOR OF UNDERGRADUATE STUDIES Adam K. List  
 DIRECTOR OF GRADUATE STUDIES Carmelo J. Rizzo  
 PROFESSORS EMERITI Robert V. Dilts, Larry C. Hall, Thomas M. Harris, David M. Hercules, Melvin D. Joesten, Mark M. Jones, Joel Tellinghuisen, David L. Tuleen, David J. Wilson  
 PROFESSORS Brian O. Bachmann, Darryl J. Bornhop, Richard M. Caprioli, Walter J. Chazin, David E. Cliffler, Stephen W. Fesik, Timothy P. Hanusa, Frederick R. Haselton, B. Andes Hess Jr., Jeffrey N. Johnston, Craig W. Lindsley, Terry P. Lybrand, Lawrence J. Marnett, Hassane S. Mchaourab, John A. McLean, Jens Meiler, Prasad L. Polavarapu, Carmelo J. Rizzo, Sandra J. Rosenthal, Sean B. Seymore, Michael P. Stone, Gary A. Sulikowski, David W. Wright  
 ASSOCIATE PROFESSORS Eva M. Harth, H. Charles Manning  
 ADJUNCT ASSOCIATE PROFESSOR Norma K. Dunlap  
 ASSISTANT PROFESSORS Lauren E. Buchanan, Janet E. Macdonald, Nathan D. Schley, Steven D. Townsend  
 PRINCIPAL SENIOR LECTURERS Adam K. List, Michelle M. Sulikowski  
 SENIOR LECTURERS Alissa Hare, Shawn T. Phillips, Craig G. Tainter, Tara D. Todd

THE Department of Chemistry seeks to provide a sound education in the fundamentals of modern chemistry as well as exposure to cutting-edge research and contemporary instrumentation in the field. This is accomplished by providing students with a solid background in the disciplines of organic, analytical, inorganic, biological, and physical chemistry. The core courses in these areas, which are supported by a variety of practical experimental experiences in the laboratory, provide students with the skills needed to think critically about chemistry. After these core courses, students delve deeper into an area of their choice. Recognizing the importance of research, which integrates and makes sense of our collective

body of knowledge, we encourage students to participate in undergraduate research. The chemistry major at Vanderbilt University meets the guidelines for the American Chemical Society approved program of study in chemistry.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Chemistry

The chemistry program is organized into four parts. The first part is a general chemistry course sequence (CHEM 1601–1602 and 1601L–1602L or AP credit) to serve as an entry point into the major. The second part consists of foundation courses in the five major disciplines of chemistry: analytical (2100), biochemistry (BSCI 2520), inorganic (3010), organic (2221–2222 or 2211–2212), and physical (3300 or 3310). The third part of the chemistry major consists of completing 8 credit hours of laboratory past 1601L–1602L. Four credit hours are from laboratory courses (2221L–2222L, 2100L, and 3315) associated with foundation courses. There are also 6 credit hours of a capstone laboratory (4965–4966) designed to provide advanced laboratory experience. The fourth part of the major consists of completing a minimum of 6 credit hours of in-depth chemistry courses. These in-depth courses build upon the content of foundation courses or integrate concepts from these foundational disciplines.

### Concentration in Chemistry

#### Required Non-chemistry Courses

One year of calculus (MATH 1300–1301 is preferred)  
 PHYS: Both 1501–1502 and 1501L–1502L,  
 or both 1601–1602 and 1601L–1602L,  
 or 1901–1902

#### Required Chemistry Courses

Required Chemistry Courses	Cr. Hrs. toward major
Chem 1601–1602 & 1601L–1602L or AP credit	0
Chem 2221–2222 (or 2211–2212) & 2221L–2222L	8
Chem 2100 & 2100L	4
Chem 3300 or 3310	3
Chem 3315	1
BSCI 2520	3
Chem 3010	3
*Two in-depth chemistry courses	6
Chem 4965–4966	6
Minimum Credit Hours for Chemistry Major	34

\* In-depth chemistry courses include all 2000-level chemistry and higher courses not explicitly required, except for CHEM 3600 and 3980–4980–4999. Other in-depth chemistry courses are Chemical and Biomolecular Engineering 3200 and 3250, and Earth and Environmental Sciences 4600, and any 5000-level chemistry lecture courses. (Qualified seniors interested in graduate-level courses must obtain approval from the course instructor, their adviser, and the director of graduate studies in chemistry. Further details are found in the Academic Policies for the College of Arts and Science.) A maximum of 3 credit hours of chemistry research (3860) may be counted as in-depth chemistry course hours.

Additional math courses, such as Math 2300 and Math 2820, are highly recommended for the chemistry major.

### Options for Concentration in Chemistry

In-depth chemistry courses can be chosen so as to define a focus area within chemistry. Students should consult with their major adviser about focus area options, or to formulate an individualized focus area option. Further descriptions of these options and other recommended courses can be found in the chemistry major handbook on the chemistry department homepage.

**Chemical Biology Focus.** The role of chemical processes in biological systems is fundamental to chemical biology. The journal *Nature Chemical Biology* defines chemical biology as “the use of chemistry to advance a molecular understanding of biology and the harnessing of biology to advance chemistry.” Chemical biology builds upon the disciplines of medicinal chemistry, biochemistry, pharmacology, genetics, bioorganic and organic chemistry. Suggested in-depth chemistry electives: 3020, 3710, 3860, 4210, 4720.

**Chemical Sciences Focus.** This option provides a broad foundation of chemistry, permitting flexibility in future career pathways and providing an excellent preparation for positions in chemical industry and for graduate programs in chemistry. Suggested in-depth chemistry electives: 3120, 3300, 3310, 3860.

**Environmental Chemistry Focus.** Environmental chemistry concerns the chemical phenomena that occur in nature. Environmental chemistry spans atmospheric, aquatic, and soil chemistry with a reliance on analytical chemistry for methods of analysis. Environmental chemistry can be applied to the understanding of issues such as ground water pollution, wastewater treatment, ozone depletion, and greenhouse gas emissions. Suggested in-depth chemistry electives: 3120, 3300, 3310, 3860, EES 4600.

**Materials Chemistry Focus.** Materials chemistry is concerned with designing and synthesizing new materials with specific useful properties and determining the relationships between physical properties and the composition and structure of these new materials. Materials chemistry encompasses all size regimes from bulk to nanoscale. Synthetic chemistry (inorganic and organic), physical chemistry, and analytical chemistry are all important components of this field. Suggested in-depth chemistry electives: 3120, 3630, 2610, 3310, 2610, 3860, 5320, 5610, 5620.

### Minor in Chemistry

The minor in chemistry requires 18 credit hours of course work, including 4 credit hours from 1602 and 1602L or AP credit, and 14 credit hours selected from any of the courses acceptable for the major in chemistry.

### Honors in Chemistry

Students with an overall GPA of at least 3.3 and a GPA of at least 3.4 in chemistry courses at the start of their junior year wishing to do honors will register for the honors research courses (CHEM 3980, 4980, 4999—each is 2 credit hours) beginning spring semester junior year. The CHEM 4965 and 4966 requirements are waived in lieu of the CHEM 3980, 4980, and 4999 registrations. Honors candidates must present a thesis on the research done under CHEM 3980, 4980, and 4999 and pass an oral examination. Additional information may be found in the chapter on Special Programs in the College.

### Licensure for Teaching

Candidates for teacher licensure in chemistry at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog. One semester of the CHEM 4965–4966 sequence will be considered fulfilled by completing the Peabody student teaching requirements.

### Introductory Courses

Introductory chemistry is offered in two different sequences, each with its own laboratory. Only one set of these courses may be taken for credit.

1. Chemistry 1010, 1010L. Intended for liberal arts students who are not planning to take any additional chemistry courses. It treats chemistry in a nonmathematical fashion, with some historical and philosophical features. Not for science and engineering students.

2. Chemistry 1601–1602. Designed for engineering, science, and premedical students. This course, which must be taken simultaneously with 1601L–1602L, serves as preparation for students intending to major in chemistry, biology, physics, or earth and environmental sciences. It is a more rigorous, mathematical approach to chemistry and a prerequisite for organic and other chemistry courses. It is not intended for liberal arts students taking a science course only to fulfill AXLE requirements.

**Course descriptions begin on page 147.**

## Cinema and Media Arts

DIRECTOR Jennifer Fay  
 ASSISTANT DIRECTOR Jonathan Waters  
 PROFESSORS Jay Clayton, Lutz Koepnick  
 ASSOCIATE PROFESSORS Jennifer Fay, Claire Sisco King, Andrea Mirabile  
 ASSISTANT PROFESSORS Se Young Kim, James McFarland, Jonathan Rattner, Haerin Shin  
 SENIOR LECTURER Jonathan Waters  
 WRITERS IN RESIDENCE Diana Grisanti, Stephen Moulds

Affiliated Faculty  
 PROFESSORS Joy Calico (Music), Colin Dayan (English), Gerald Fical (History), Sam B. Girgus (English), Yoshikuni Igarashi (History), Daniel Levin (Psychology, Peabody), Kelly Oliver (Philosophy), T. Sharpley-Whiting (African American and Diaspora Studies and French), Benigno Trigo (Spanish), Mark A. Wollaeger (English)  
 ASSOCIATE PROFESSORS Vanessa Beasley (Communication Studies), Phillip Franck (Theatre), Jay Geller (Divinity School), Jon Hallquist (Theatre), Terry Hallquist (Theatre), Stanley Link (Music), Letizia Modena (French and Italian), Emanuelle Oliveira (Portuguese), Vesna Pavlovic (Art), Lynn T. Ramey (French)  
 ASSISTANT PROFESSORS Peter Lorge (History), Anand Taneja (Religious Studies)  
 SENIOR LECTURER Scott Juengel (English)

CINEMA and Media Arts is an interdisciplinary major and minor that combines the practice of filmmaking with the study of film and media theory and history. Emphasizing cinema as both a modern aesthetic form and a hands-on cultural practice, the program trains students for careers in film and media production, communications, academic media studies, and community and social relations. While the program encourages new ways of thinking, looking, and making, it also develops the

traditional learning skills of a liberal education. A core curriculum in film and media theory, history, and filmmaking is supplemented with classes in the related arts, disciplines, and ethnic and non-U.S. national cinemas. The major concludes with a senior seminar.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Major in Cinema and Media Arts*

The CMA major consists of 36 credit hours. The requirements are as follows:

#### CORE REQUIREMENTS

1. CMA 1500 (Fundamentals of Film and Video Production).
2. CMA 1600 (Introduction to Film and Media Studies).
3. CMA 2100 (Intermediate Filmmaking: Alternate Forms).
4. CMA 2200 (Intermediate Filmmaking: The Fiction Film).
5. CMA 2300 (Film and Media Theory).
6. CMA 2400 (History of World Cinema).
7. Senior Seminar—CMA 4961 or 4962.
8. Two CMA electives: 1111 (First-Year Writing Seminar); 2500W (Screenwriting); 3891 (Special Topics in Film and Video Production); 3892 (Special Topics in the Study of Film). Please note that 2100 and 2200 do not count for elective credit.
9. One course in ethnic or non-U.S. national cinemas: African American and Diaspora Studies 1506 (Reel to Real: Film Aesthetics and Representation), Asian Studies 2512 (Explorations of Japanese Animation), French 3230 (French and Francophone Cinema), German 2442 (War on Screen), German 2444 (German Fairy Tales: From Brothers Grimm to Walt Disney), German 2443 (German Cinema: Vampires, Victims, and Vamps), German 2445 (Nazi Cinema: The Manipulation of Mass Culture), Italian 3640 (Classic Italian Cinema), Jewish Studies 2290W (Imagining the Alien: Jewish Science Fiction), Portuguese 3302 (Brazilian Pop Culture), Spanish 3355 (Advanced Conversation through Cultural Issues in Film), Spanish 3365 (Film and Recent Cultural Trends in Spain), Spanish 2990 (Images of the Feminine in Spanish Cinema).
10. One course in film and the other arts: Art Studio 1200 (Photography I), Art Studio 1202 (Digital Imaging I), Art Studio 1700 (Video Art), Art Studio 1702 (Interactive Portable Media and Cell Phone Art I), Art Studio 2200 (Photography II), 2202 (Digital Imaging II), 2700 (Video Art II), 2702 (Interactive Portable Media and Cell Phone Art II), History of Art 2680 (British Art: Tudor to Victorian), History of Art 2710 (Twentieth-Century European Art), Music Literature 1300 (Music, The Arts, and Ideas), Music Literature 2320 (Exploring the Film Soundtrack), Theatre 1711 (Introduction to Theatrical Production), Theatre 1811 (Marshals, Mobsters, Monsters, Magnums, and Musicals: American Movie Genres), Theatre 3721 (Elements of Basic Design: Scenery and Properties), Theatre 3761 (Elements of Basic Design: Lighting and Sound), Theatre 3741 (Elements of Basic Design: Costuming and Makeup).

11. One course in film and other disciplines: Communication Studies 3720 (Communicating Gender), Communication Studies 2950 (Rhetoric of Mass Media), Communication Studies 3710 (Cultural Rhetorics of Film), Communication Studies 3890 (Selected Topics in Communication Studies, when a film topic is offered), English 3642 (Film and Modernism), English 3694 (America on Film: Art and Ideology), English 3899 (Special Topics in Film), Philosophy 3013 (History of Aesthetics), Philosophy 3615 (Philosophy of Film), Religious Studies 3229 (The Holocaust: Its Meanings and Implications), Religious Studies 4552 (Islam in the Modern World), Women's and Gender Studies 1272 (Feminism and Film).

Other courses in film and media studies also may be counted toward the major, subject to the approval of the program director.

### *Honors Program*

The Honors Program in Cinema and Media Arts offers excellent students the opportunity to undertake a high-level independent research and/or creative project during their senior year. Projects must be rigorous and in-depth, and demonstrate a student's ability to sustain an argument, an aesthetic principle, or a narrative arc in a substantial form. For admission to the Honors Program, students must have and maintain until graduation an overall grade point average of 3.3 and an average of 3.5 in courses counting toward the major. The student must submit an application to the program director outlining the thesis topic. In addition to completing the major requirements listed above, during the senior year the student is required to register for Cinema and Media Arts 4998 (3 credit hours) and 4999 (3 credit hours) in order to complete the thesis. An oral examination on the thesis and its area is to be completed during the final semester of undergraduate study.

### *Minor in Cinema and Media Arts*

The minor consists of 18 credit hours. The requirements are as follows:

1. CMA 1500 (Fundamentals of Film and Video Production).
2. CMA 1600 (Introduction to Film and Media Studies).
3. One CMA course in intermediate filmmaking: 2100 (Intermediate Filmmaking: Alternate Forms); 2200 (Intermediate Filmmaking: The Fiction Film).
4. One CMA course in intermediate cinema studies: 2300 (Film and Media Theory); 2400 (History of World Cinema).
5. Two CMA electives: 1111 (First-Year Writing Seminar); 2500W (Screenwriting); 3891 (Special Topics in Film and Video Production); 3892 (Special Topics in the Study of Film).

Other courses related to film and media studies may also be counted as electives, subject to the approval of the program director.

**Course descriptions begin on page 150.**

## Classical and Mediterranean Studies

DIRECTOR Joseph L. Rife  
 DIRECTOR OF UNDERGRADUATE STUDIES Daniel P. Solomon  
 PROFESSORS EMERITI Robert Drews, F. Carter Phillips, Jack M. Sasson,  
 Susan Ford Wiltshire  
 PROFESSOR David J. Wasserstein  
 ASSOCIATE PROFESSORS Kathy L. Gaca, Joseph L. Rife, Betsey  
 Robinson, Barbara Tsakirgis  
 ASSISTANT PROFESSORS Scott F. Aikin, Ari Bryen, Mireille Lee,  
 David A. Michelson  
 SENIOR LECTURERS G. Edward Gaffney, Daniel P. Solomon,  
 Chiara Sulprizio

CLASSICAL studies have always been at the heart of a liberal education because they afford unmatched perspectives from which to understand our own time. Courses are offered in the history, religion, art, philosophy, social and cultural issues, literature, and mythology of the ancient world. The curriculum covers 3,500 years of human experience in the ancient Near East, Greece, and Roman Europe, from the beginnings of Western civilization through the Christianization of Europe.

Three major programs are available. Students may declare only one of the majors offered by the Department of Classical and Mediterranean Studies; double or triple majors within the department are not permitted. Students majoring in classical languages approach the ancient world primarily through its literature, read in the original language. Students majoring in classics integrate the ancient texts with other kinds of evidence (sociology, religion, art, etc.), in order to compare the words of Greeks and Romans to their actions; they may apply any number of courses in Greek and/or Latin toward this major, as long as two language courses are at the advanced level. Students majoring in classical civilization receive the broadest introduction to the ancient world, and they read the primary sources in translation.

Majors in classical languages or classics are encouraged to spend a semester at the Intercollegiate Center for Classical Studies in Rome; all students may apply for a Maymester session in Greece or Rome led by one of our own professors. A summer program at the American School of Classical Studies in Athens is also available.

The Classics Society functions as the department's extracurricular organization. Eta Sigma Phi is the national honorary society for classics.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Classical Languages*

Students complete at least 30 credit hours in Greek and Latin, including at least two courses of each language. Only one elementary sequence (either Greek 1101–1102 or Latin 1101–1102 or Latin 1103) may count toward the 30 credit hours required for the major.

### *Program of Concentration in Classics*

Students complete at least 30 credit hours in classics, Greek, Latin, or other eligible courses (see below), at least 6 credit

hours of which must be in Greek or Latin courses numbered 3010 or higher.

### *Program of Concentration in Classical Civilization*

Students complete at least 30 credit hours in classics, Greek, Latin, or other eligible courses (see below). Relevant courses in religion will be allowed at the discretion of the director of undergraduate studies. No more than 11 credit hours may be taken in courses numbered 2050 or below.

The following courses may be counted toward a major in classics or classical civilization: History of Art 1111-09, 2220, 3240W, 3228W, 3224, 3252, and 2210; Jewish Studies 1200; Philosophy 2100 and 2101; Political Science 2202. Other courses may be counted with the approval of the director of undergraduate studies, but a minimum of 18 credit hours must be in courses from classics, Greek, and/or Latin.

### *Honors Program in Classics*

Admission requirements are: completion of junior year and completion of at least 6 credit hours of work in advanced Greek or Latin courses (above Greek 3010 or Latin 3010 or higher), and an overall GPA of 3.4, with 3.5 in courses within the department (including hours earned at the ICCS in Rome) that count toward the major. Candidates should signal their interest to the director of undergraduate studies by the beginning of the second semester of their junior year. Candidates must submit a thesis proposal for approval by the departmental faculty before they can be admitted to the Honors Program.

In addition to maintaining the stated GPA through the senior year, a student must satisfy the following requirements in order to graduate:

1. Complete 12 credit hours in advanced Greek and/or Latin courses (Greek 3010 or Latin 3010 or higher).
2. Complete Classics 4998 and 4999 for 6 credit hours in addition to the 30 credit hours required by the major, culminating in a written senior thesis defended orally before the department.

### *Honors Program in Classical Languages*

Admission requirements are: completion of junior year and completion of at least 6 credit hours of work in advanced Greek or Latin courses (Greek 3010 or Latin 3010 or higher), and an overall GPA of 3.4, with 3.5 in courses that count toward the major. Candidates should signal their interest to the director of undergraduate studies by the beginning of the second semester of their junior year. Candidates must submit a thesis proposal for approval by the departmental faculty before they can be admitted to the Honors Program.

In addition to maintaining the stated GPA through the senior year, a student must satisfy the following requirements in order to graduate:

1. Complete 18 credit hours in advanced Greek and/or Latin courses (Greek 3010 or Latin 3010 or higher).
2. Complete Classics 4998 and 4999 for 6 credit hours in addition to the 30 credit hours required by the major, culminating in a written senior thesis defended orally before the department.

There is no Honors Program in the classical civilization concentration.

### *Minor in Classics*

Students are required to complete Greek 2202 or Latin 2202 or a higher-level language course plus an additional 15 credit hours in courses that count toward the concentration in classics, of which at least 9 must be numbered 2060 or above. Other courses may be counted with the approval of the director of undergraduate studies, but a minimum of 12 credit hours must be in courses from classics, Greek, and/or Latin.

### *Minor in Classical Civilization*

Students are required to complete 18 credit hours in courses that count toward the concentration in classical civilization, of which at least 12 must be numbered 2060 or above. Other courses may be counted with the approval of the director of undergraduate studies, but a minimum of 12 credit hours must be in courses from classics, Greek, and/or Latin.

### *Licensure for Teaching*

Candidates for teacher licensure in Latin at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

### Classics

Courses below the 4000 level require no knowledge of either Greek or Latin.

**Course descriptions begin on page 151.**

### Greek

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 166.**

### Latin

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 180.**

## Communication of Science and Technology

DIRECTOR David A. Weintraub

### Affiliated Faculty

PROFESSORS Michael Bess (History), Jay Clayton (English), David J. Ernst (Physics and Astronomy), Richard F. Haglund Jr. (Physics and Astronomy), Lutz Koepnick (German Studies and Cinema and Media Arts), Jonathan M. Metz (Medicine, Health, and Society), Jeffrey D. Schall (Psychology), Robert J. Scherrer (Physics and Astronomy), Arleen Tuchman (History), David A. Weintraub (Physics and Astronomy)

ASSOCIATE PROFESSORS Jennifer M. Fay (Cinema and Media Arts and English), Jonathan M. Gilligan (Earth and Environmental Sciences), Ruth Rogaski (History and Asian Studies)

ASSISTANT PROFESSOR Ole Molvig (History)

ASSOCIATE PROFESSOR OF THE PRACTICE OF ENGINEERING Christopher Rowe (General Engineering)

SENIOR LECTURERS Daniel Morgan (Earth and Environmental Sciences), Stephen Ornes (Communication of Science and Technology)

THE study of the communication of science and technology is an interdisciplinary enterprise that draws upon the scientific, engineering, and communication, both oral and written, resources of Vanderbilt University. The program is designed for students who have an interest in science and technology and also are interested in how science and technology are communicated to the larger world outside science, engineering, and medicine.

Interested students should contact the director of the program, David A. Weintraub, Department of Physics and Astronomy.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Communication of Science and Technology*

Students majoring in the communication of science and technology will be expected to complete a core of courses that are essential to understanding communication, as well as a coherent program of courses that provide scientific and engineering background. The major consists of either 38 or 39 credit hours.

A student may count as many as 6 credit hours as part of both this interdisciplinary major and a second major. A student may only include a maximum of 15 credit hours of 1000-level course work.

#### 1) *Written and Oral Communications courses (9 credit hours from 3 courses)*

Three courses, with a minimum 3 credit hours per course, as follows:

- a. CSET 2100 (Science Communication Tools and Techniques) or CSET 3890 (Special Topics). If neither course is offered for two consecutive years, majors may, with approval of the program director, substitute a course from category '1c.'
- b. One advanced public-speaking course: CMST 2100 (Argumentation and Debate), CMST 2110 (Persuasion), or 2120 (Organizational and Managerial Communication)

c. One advanced (2000-level or higher) “W” course from any of the following:

- i. any 2000-level or higher “W” course from any Natural Science program (as used here, “Natural Science” includes all courses identified as “MNS” courses in AXLE except MATH and PHIL courses)
- ii. any 2000-level or higher “W” course from any Engineering program
- iii. any 2000-level or higher “W” course from MHS
- iv. ENGL 3210 (Intermediate Nonfiction Writing), 3220 (Advanced Nonfiction Writing), ENGL 3728/3728W (Science Fiction), or ENGL 3720/3720W (Literature, Science, and Technology)

2) *Natural Science and Engineering courses (15 credit hours from five courses)*

Five courses (minimum 3 credit hours per course), at least three of which must be 2000-level or higher Natural Science courses. (As used here, “Natural Science” includes all courses identified as MNS courses in AXLE except MATH and PHIL courses.) The other two courses may be 2000-level or higher Natural Science courses or courses taken at any level from the School of Engineering. Students will count 15 credit hours of Natural Science and/or Engineering courses toward this part of 38- or 39-credit-hour requirement, even if they choose to take five 4-credit-hour courses. Engineering “research,” “project,” “design,” “seminar,” “independent study,” and introductory programming courses (e.g., BME 3860, 3861, 4950, 4951, 4959; ChBE 4950W, 4951W, 3860, 3861, 4959; CE 3841, 3842, 3843, 4950, 4951, 4900; CS 1101, 1103, 3860, 3861; EECE 3850, 3851, 4950, 4951, 4959; ENGM 3850, 3851, 4951; ES 1115, 0703, 3860; MSE 3850, 3851; ME 3841, 3842, 3860, 4951, 4959; SC 3841, 3842, 3843, 3851, 3852, 3853) do not count toward this requirement. Students may count the three 1-credit-hour courses ES 1401, 1402, and 1403 as equivalent to a single 3-credit-hour course if they earn credit for all three courses.

3) *Statistics (3 credit hours) selected from:*

- BSCI 3270 (Statistical Methods in Biology)
- ECON 1500 (Economic Statistics), 1510 (Intensive Economic Statistics)
- MATH 1011 (Probability and Statistical Inference), 2810 (Probability and Statistics for Engineering), 2820 (Introduction to Probability and Mathematical Statistics)
- PSY 2100 (Quantitative Methods)
- PSY-PC 2110 (Introduction to Statistical Analysis)
- PSY-PC 2120 (Statistical Analysis)
- BME 3200 (Analysis of Biomedical Data)
- SOC 2100 (Statistics for Social Scientists)

4) *One course bridging science, engineering, or medicine and health with non-science content and issues, including public policy courses and environmental courses (3 credit hours):*

- ANTH 2109 (Food Politics in America), 3143 (Medical Anthropology), 3343 (Biology and Culture of Race), 3141 (Anthropology of Healing), 3142 (Medicine, Culture, and the Body), 3372 (Human Osteology), 4373 (Health and Disease in Ancient Populations)
- ASIA 2630 (Chinese Medicine)
- ASTR 2130 (Theories of the Universe)
- ECON 2350 (Health Care Policy)
- EES 2150 (Science, Risk, and Policy)
- ENGL 3730 (Literature and the Environment)

HIST 1480 (The Darwinian Revolution), 1500 (History of Modern Sciences and Society), 1510 (The Scientific Revolution), 2780 (Superhuman Civilization), 2800 (Modern Medicine), 2810 (Women, Health, and Sexuality), 3030 (Epidemics in History), 3040 (Health and the African American Experience), 3045W (US Eugenics 1865–present), 3050 (Innovation), 3070W (Science, Technology, and Modernity)

MHS — any course except 1111, with the exception of special topics internship, service learning, research, seminar, independent study and honors classes

- PHIL 3616 (Philosophy and the Natural Sciences)
- PSCI 3253 (Ethics and Public Policy), 2255 (Public Policy Problems), 2256 (Politics of Public Policy)
- PSY 3705 (Human Sexuality)
- RLST 3921 (Ethics and Ecology), 3941 (Religion, Science, and Evolution)

SOC 3311 (Climate Change and Society), 3312 (Environment and Development), 3314 (Environmental Inequality and Justice), 3301 (Society and Medicine), 3315 (Human Ecology and Society)

WGS 2240 (Introduction to Women’s Health), 2268 (Gender, Race, Justice, and the Environment), 2270 (Ecofeminism: Theory, Politics, and Action)

5) *Electives (8 or 9 credit hours) chosen from:*

- a. CMA 1500 (Fundamentals of Film and Video Production), 1600 (Introduction to Film and Media Studies), 2100 (Intermediate Filmmaking: Alternate Forms), 2200 (Intermediate Filmmaking: The Fiction Film), 2500W (Screenwriting), 2600W (Advanced Screenwriting), (no more than 2 courses)
- b. category 1c (no more than 2 courses)
- c. category 2 (no more than 2 courses)
- d. category 4 (no more than 2 courses)
- e. A combination of at least one hour of CSET 3840 (Directed Study) and at least one hour of CSET 3841 (Project in Science Writing and Communicating) may be counted together as a single elective course. No more than 3 credit hours of CSET 3840 and 3841 may count toward the major.

### *Internships*

Students are encouraged to pursue off-campus summer internships in such places as national parks, NASA, the National Institutes of Health, or public television stations. If an internship requires course credit, credit can be earned through Interdisciplinary Studies (INDS) 3881 and 3884 (1 credit hour each); they must be taken as P/F hours, and do not count toward the major.

### *Honors Program*

CSET Honors is a selective program of individual undergraduate work, supervised by faculty advisers. Honors candidates propose, research, and write a thesis that demonstrates the ability to communicate science, in depth, to a nonscientific audience.

#### **Requirements for Admission**

To be admitted to the Honors Program in CSET, a student must

- 1) be a CSET major;
- 2) have completed at least 30 of the required hours for the CSET major;

- 3) have completed one semester of CSET 3840 (1–3 credit hours) and one semester of CSET 3841 (1–3 credit hours). With permission of the program director, students may substitute research experience taken for credit within a scientific or engineering program for CSET 3840;
- 4) have a GPA of at least 3.30 in all work previously taken for credit;
- 5) have a GPA of at least 3.40 in all courses taken that count toward completion of the CSET major.

#### Requirements for Completion (minimum 39 credit hours)

To earn Honors or Highest Honors in CSET, a student must

- 1) complete the CSET major (minimum 38 credit hours);
- 2) complete at least one semester of CSET 4998 (1–3 credit hours);
- 3) present an oral defense of the written CSET 4998 thesis before a faculty examination committee;
- 4) have a GPA of at least 3.30 in all work taken for credit and 3.40 in all courses that count toward the CSET major.

#### Course of Study

Interested students may apply in the spring of their junior year or the fall of the senior year. Applicants must have completed CSET 3840 (or the equivalent) and must have completed or be enrolled in CSET 3841. The application includes a one- to two-page proposal of the planned thesis and the signature of the faculty member who will be the thesis adviser.

Students in the Honors Program sign up for CSET 4998 (Honors Thesis). Students may enroll in CSET 4998 for one or two semesters, for up to 3 credit hours per semester.

The final thesis must be submitted no later than two weeks before the end of classes in the semester of graduation.

The oral defense of the thesis will take place one to two weeks after the final thesis is submitted. The examination committee is composed of the thesis supervisor and two additional faculty members, at least one of whom must be a faculty member affiliated with the CSET program. The oral defense is public and should take approximately one hour, including time for questions from members of the committee. The faculty examination committee will determine by majority vote whether the student has earned Honors and whether said student should receive Honors or Highest Honors. Highest Honors is reserved for students with GPAs in the CSET major and overall above 3.50, whose theses are of near-publication quality, and whose oral defenses are at the highest level.

#### Minor in Communication of Science and Technology

The minor in the Communication of Science and Technology consists of seven courses, totaling a minimum of 21 credit hours, distributed as follows:

- 1) *Written and Oral Communications courses (3 courses):*
  - a. CSET 2100 or CSET 3890. If neither course is offered for two consecutive years, minors may, with approval of the program director, substitute a course from category “1c.”
  - b. One advanced public-speaking course: CMST 2110 or 2120
  - c. One advanced (2000-level or higher) “W” course as defined in the rules for the CSET major

#### 2) *Natural Science and Engineering courses (4 courses):*

a. One course bridging science, engineering, or medicine and health with non-science content and issues, including public policy courses and environmental courses (selected from list of courses for majors)

b. Three courses (minimum 3 credit hours per course) from engineering and/or the natural sciences, at least two of which must be 2000-level or higher Natural Science courses (as defined for the major). The other course may be a 2000-level or higher Natural Science course or a course taken at any level from the School of Engineering. Students may count 9 credit hours of Natural Science and/or Engineering courses toward this part of 21-credit-hour requirement, even if they choose to take three 4-credit-hour courses. Students may count the 1-credit-hour courses ES 1401, 1402, and 1403 as equivalent to a single 3-credit-hour course if they earn credit for all three courses.

**Course descriptions begin on page 152.**

## Communication Studies

A&S

CHAIR Bonnie J. Dow  
 DIRECTOR OF UNDERGRADUATE STUDIES Paul H. Stob  
 PROFESSOR EMERITUS Kassian A. Kovalcheck  
 PROFESSORS Bonnie J. Dow, John M. Sloop  
 ASSOCIATE PROFESSORS Vanessa B. Beasley, Jeffrey A. Bennett,  
 Claire Sisco King, Paul H. Stob, Isaac West  
 SENIOR LECTURERS Neil Butt (Director of Debate), M. L. Sandoz  
 (Director of Forensics), Courtney C. Travers, Dustin A. Wood  
 LECTURER John P. Koch (Assistant Director of Debate)

THE Department of Communication Studies offers a major and a minor that include courses in the following areas: historical and theoretical foundations of communication study, argumentation and oral advocacy, the historical and critical study of public discourse and deliberation, and the analysis of mass media and culture.

The Vanderbilt University Varsity Debate Team competes at national and regional levels. A full program of intercollegiate debate is available for students who choose to participate in forensics.

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#### Program of Concentration in Communication Studies

Communication studies explores purposive human communication. The Department of Communication Studies is particularly devoted to an understanding of public discourse in the broadest sense, with an emphasis on the role of persuasion in civil society. To that end the subjects of study range from political discourse to commercial advertisement, from the history of rhetoric to the impact of mass media, from criticism of American public oratory to issues of freedom of speech. The department offers courses involving practice, criticism, and theoretical analysis. Education in these areas has traditionally produced citizen advocates who enter public life in business, law, journalism, and communication.

A major in communication studies requires 30 credit hours of course work. The requirements and options for the major are as follows:

1. Two courses (6 credit hours) in Foundations: 1002 and 1500.
2. One course (3 credit hours) in Argumentation and Advocacy: 2100, 2110, 2120.
3. Three courses (9 credit hours) in Public Discourse and Deliberation: 3000, 3001, 3002, 3110, 3120, 3140, 3600, 3700; one of which must be 3000, 3001, or 3002.
4. Three courses (9 credit hours) in Culture, Theory, and Critique: 2800, 2950, 3100, 3620, 3620W, 3710, 3720, 3740.
5. One elective course (3 credit hours), selected from the courses listed in requirements 2 through 4, which has not been counted toward those requirements.

1111, 3840, 3850, 3890, 4960, and 4961 may be counted toward the major in the category corresponding to the topic of the course, with the permission of the director of undergraduate studies.

### *Minor in Communication Studies*

A minor in communication studies requires completion of 18 credit hours from the following requirements and options:

1. Two courses (6 credit hours) in Foundations: 1002 and 1500.
2. One course (3 credit hours) in Argumentation and Advocacy: 2100, 2110, 2120.
3. Three courses (9 credit hours) from requirements 3 and 4 in the major; one of which must be 3000, 3001, or 3002.

1111, 3840, 3850, 3890, 4960, and 4961 may not be counted toward the minor.

Course descriptions begin on page 152.

## *Earth and Environmental Sciences*

CHAIR Steven L. Goodbred  
 DIRECTOR OF UNDERGRADUATE STUDIES Lily L. Claiborne  
 DIRECTOR OF GRADUATE STUDIES Guilherme Gualda  
 PROFESSORS EMERITI Leonard P. Alberstadt, Molly Fritz Miller,  
 Arthur L. Reesman, William G. Siesser, Richard G. Stearns  
 PROFESSORS John C. Ayers, Ralf Bennartz, James H. Clarke, David J.  
 Furbish, Steven L. Goodbred, George M. Hornberger, Calvin F. Miller  
 ASSOCIATE PROFESSORS Jonathan M. Gilligan, Guilherme Gualda  
 ASSISTANT PROFESSORS Simon A. F. Darroch, Larisa R. G. DeSantis,  
 Maria Luisa Jorge, Neil P. Kelley, Jessica L. Oster  
 SENIOR LECTURERS Lily L. Claiborne, Daniel J. Morgan

THE earth and environmental sciences are aimed at interpreting Earth's dynamic history—its age and origin as recorded in rocks and the landscape—and at understanding how geological processes affect modern environmental and ecological systems. Among the natural sciences, ours is the quintessential interdisciplinary science, providing vital perspective on how Earth's physical and geochemical template simultaneously sustains and threatens life, and influences human interactions with Earth.

The Department of Earth and Environmental Sciences (EES) offers an undergraduate major leading to the B.A. degree. Students majoring in EES participate in field and laboratory work. The comparatively small size of the faculty and student body allows many opportunities for faculty-student interaction. Students use the major as preparation for graduate study, for careers in environmental studies and resource exploration (petroleum, minerals), or for related careers in such fields as land use planning, teaching, law, or engineering.

Research programs in the department, which in many cases involve students, employ field, analytical, and experimental methods. A wide variety of earth processes are investigated, ranging from the migration of fluids and generation of magmas in Earth's crust, to the evolution of rivers and landscapes, to the evolution of sedimentary and biological environments, to geological processes in the human environment. Study areas, in addition to Middle Tennessee, include the southwestern United States, the Pacific northwest, the southern Appalachians, Antarctica, South Asia, Brazil, and New Zealand.

For students with primary interests in environmental issues, there are three degree options. A student may major in EES or may construct an individualized interdisciplinary major. Alternatively, a student may major in another conventional discipline and augment that with an earth and environmental science minor.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Earth and Environmental Sciences*

Three options are available within the EES major. All provide a solid grounding in the earth and environmental sciences. The differences are in requirements for supporting sciences and mathematics and for research. Option I provides a background for careers or post-graduate work in related fields such as teaching, law, or business and for some graduate programs and employment opportunities in earth and environmental sciences. Option II prepares students well for graduate work and careers in the earth and environmental sciences. Option III (Honors) is designed for excellent, highly motivated students who want to pursue research as undergraduates.

Required EES courses	32 credit hours toward major for all options
EES 1510/1510L	4
EES 2510 (or 1020 prior to fall 2011)	4
EES 3220 (or 3220W prior to fall 2012)	4
EES 3250	4
EES 3260	4
EES 3330	4
EES 3340	4
EES 4961	1
One additional course selected from the following: EES 2110, 4420, 4550, 4600, 4820, 4830, 6200, 6891	3

*Option I.* Provides students with a comprehensive background in geoscience. In addition to the courses listed above, students are required to take one course each from two of the following groups.



*Group A: Physical World*

Physics I (Physics 1601/1601L 4 hr or Physics 1901 5 hr)

Chemistry I (Chemistry 1601/1601L 4 hr)

Astronomy (2110 3 hr)

*Group B: Earth Life*

Biological Sciences (1100/1100L 4 hr or 1510/1510L 4 hr or 1103 4 hr or 2218 4 hr or 2219 4 hr or 2238/2238L 4 hr)

*Group C: Quantitative Skills*

Calculus I (Math 1100 4 hr or 1200 3 hr or 1300 4 hr)

Statistics (Math 1010 3 hr)

Total credit hours: 38–41

*Option II.* Provides students with most course work needed for a career or graduate studies in geoscience. Students take the required EES courses and complete the following:

Physics I (1601/1601L 4 hr)

Chemistry I (1601/1601L 4 hr)

Calculus I (Math 1200 3 hr or 1300 4 hr)

Total credit hours: 43–44

In addition, the second semesters of Chemistry, Physics, and Calculus as well as one or more courses in Biological Sciences are highly recommended to complete courses commonly required for graduate school or employment. Recommended selections include:

Physics II (1602/1602L 4 hr) or Chemistry II (1602/1602L 4 hr) or Calculus II (Math 1201 3 hr or 1301 4 hr)

Biological Sciences (1100/1100L 4 hr or 1510/1510L 4 hr or 1103 or 2218 4 hr or 2219 4 hr or 2238/2238L 4 hr) or

Astronomy (2110 3 hr)

*Option III. Honors.* Provides research experience as well as course work preparation for a career or graduate studies in earth or environmental sciences. Course work is the same as for Option II with the addition of EES 4998 and 4999 (4 credit hours).

Total credit hours: 47–48

Interested students should apply to the undergraduate adviser for entry into the Honors program before the end of fall semester, junior year. A minimum of a 3.3 grade point average both overall and in the major is required for entry into the Honors program.

Working closely with a faculty adviser, students in the Honors program complete a research project of interest to both the student and faculty member during the senior year. In order to graduate with honors in EES, a student must: (1) maintain a 3.3 average; (2) complete the required courses for Option II plus EES 4998 and 4999; (3) satisfactorily present the results of his/her research in written form as a senior thesis to two members of the faculty and orally to students and faculty of the department.

*Minor in Earth and Environmental Sciences*

The minor in EES provides students with a broad background in earth processes, systems, and history, and an introduction

to environmental issues. This background is highly relevant to many different fields of endeavor. The minor does not, however, fully prepare students for graduate studies or employment as earth scientists. Students should consult with the director of undergraduate studies about how the minor in EES fits with their career or graduate school interests.

The minor consists of at least five courses (at least 17 credit hours; EES 1510/1510L and 1030/1030L each count as one course; EES 2150 does not count toward the minor). Although EES 1510 (with 1510L) and 1030 (with 1030L) are highly recommended, students are encouraged to choose courses based on their interests and career plans and to discuss course selection with the director of undergraduate studies. No more than two 1000-level courses count toward the minor. Two courses with labs are required; one must be numbered above 2000. No credit toward the minor is given for EES 3841–3842 or 3851–3852.

*Minor in Environmental Science*

The interdisciplinary minor in environmental science requires a minimum of 15 credit hours. Environmental science is the study of how the earth's natural environmental processes work, how they have been or can be modified by humans and society, and how such modifications impact on the biosphere, at the levels of individuals through ecosystems. An environmental science minor provides students the opportunity to expand their education to include a coherent program in the scientific aspects of how we interact with and modify the earth's environment.

Students who want to minor in environmental science must take a minimum of five courses chosen from the courses listed below and approved by an adviser. Two must be from the core environmental science list (A), and at least two others must be from either the environmental science list (C) or the core environmental science list (A). No more than one 1000-level course may be counted toward the minor. Not more than two courses can come from the student's major department, recognizing that such courses cannot be counted simultaneously for both a major and a minor.

A) CORE ENVIRONMENTAL SCIENCE: Anthropology: 4154, Environmental Anthropology. Biological Sciences: 2218, Introduction to Plant Biology; 2219, Introduction to Zoology; 2238, Ecology. Environmental Engineering: 4600, Environmental Chemistry. Earth and Environmental Sciences: 4600, Geochemistry.

B) CORE ENVIRONMENTAL STUDIES: Anthropology: 4154, Environmental Anthropology. Sociology: 3315, Human Ecology and Society.

C) ENVIRONMENTAL SCIENCE: Biological Sciences: 2205, Evolution; 2210, Principles of Genetics; 2210L, Genetics Laboratory; 2520, Biochemistry; 4265, Nucleic Acid Transactions; 3270, Statistical Methods in Biology. Chemistry: 2100, Introduction to Analytical Chemistry; 3120, Instrumental Analytical Chemistry; 2221–2222, Organic Chemistry. Civil Engineering: 3700, Fluid Mechanics; Environmental Engineering: 4707, Solid and Hazardous Waste Management; 4610, Biological Unit Processes. Earth and Environmental Sciences: 1510, The Dynamic Earth: Introduction to Geological Sciences; 1030, Oceanography; 3220, Life through Time. Mathematics: 2821, Introduction to Applied Statistics.

D) ENVIRONMENTAL STUDIES: Philosophy: 3616, Philosophy and the Natural Sciences; 3611, Environmental Philosophy.

### *Licensure for Teaching*

Candidates for teacher licensure in earth and space science at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

**Course descriptions begin on page 154.**

## *Economics*

CHAIR Eric W. Bond

VICE CHAIR Robert A. Driskill

DIRECTOR OF UNDERGRADUATE STUDIES Malcolm Getz

DIRECTOR OF GRADUATE STUDIES Jennifer F. Reinganum

PROFESSORS EMERITI Jeremy Atack, T. Aldrich Finegan, C. Elton

Hinshaw, Cliff J. Huang, Andrea Maneschi, Clifford S. Russell, John J.

Siegfried, George H. Sweeney, Anthony M. Tang, Fred M. Westfield

PROFESSORS Kathryn H. Anderson, Eric W. Bond, Christopher (Kitt)

Carpenter, William J. Collins, John Conley, Mario Crucini, William

W. Damon, Andrew F. Daughety, Robert A. Driskill, Benjamin Eden,

Kevin X. D. Huang, Gregory Huffman, Atsushi Inoue, Tong Li, Mattias

Polborn, Jennifer F. Reinganum, Peter L. Rousseau, Kamal Saggi,

Mototsugu Shintani, W. Kip Viscusi, John A. Weymark, Myrna

Wooders

ASSOCIATE PROFESSORS Malcolm Getz, Andrea Moro

ASSISTANT PROFESSORS Andrew Dustan, Andrew Goodman-Bacon,

Federico H. Gutierrez, Eun Jeong Heo, Gregory Leo, Alejandro

Molnar, Hyunseung Oh, Claudia Rei, Joel Rodrigue, Pedro Sant'Anna,

Wisarut Suwanprasert, Diana N. Weymark, Ariell Zimran

PRINCIPAL SENIOR LECTURER Rupinder Saggi

SENIOR LECTURERS Ana Regina Andrade, Stephen G. Buckles,

Hojjatallah Ghandi, Heather Luea, Christina H. Rennhoff, Stephanie So,

John Vrooman

THE Department of Economics offers an undergraduate major and minor in economics. Qualified economics majors may also elect to take graduate courses or participate in honors work.

The department participates with the Department of History in a concentration in economics and history. Other economics-related minors are discussed under Managerial Studies.

Economics 1010 and 1020 are prerequisites to all courses numbered above 2000, except Economics 2220 which only requires Economics 1010.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Economics*

The requirements for the major include completion of at least 33 credit hours in economics courses, including 1010, 1020, 1500 or 1510 (or Math 2820, Math 2820L, and Math 2821), 3010, 3020. Students who complete Economics 3050 with Math 2820 and 2820L as a prerequisite need not take Economics 1500 or 1510. At least 9 credit hours must be in courses numbered 3050 or above. Courses in Financial Economics do not carry credit in the economics major. Economics 1111 may be counted as an elective. No more than 3 credit hours of independent study may be included in the minimum 33 credit hours required for the major.

### *Mathematics Prerequisite*

Two semesters of calculus are strongly recommended for majors and minors in the department. Calculus is a prerequisite for Economics 1500, 1510, 3010, and 3020, courses that are required in the economics major and minor. At least one semester of calculus is required for all our programs.

### *Minor in Economics*

The minor in economics requires 21 credit hours, including 1010, 1020, 1500, or 1510 (or Math 2820 and Math 2820L), 3010, and 9 credit hours of electives. At least one elective must be numbered 3050 or above. One semester of calculus is prerequisite to 1500, 1510, and 3010. Financial Economics courses may not be taken for credit in the minor in economics.

### *Honors Program*

An honors program is available in economics. This program is designed for highly motivated students interested in doing independent research. Honors candidates must take two semesters of calculus and 36 credit hours of work in economics, including all 15 credit hours of courses required for the Economics major. The following Honors Core requirements must be met in order for Honors in Economics to be awarded: (1) Economics 3050, Introduction to Econometrics (3 credit hours); (2) Economics 3698, Junior Honors Research (1 credit hour); (3) Economics 3851–3852, Senior Thesis (6 credit hours); (4) Economics 4981–4982, Honors Seminar (2 credit hours); (5) 9 credit hours of electives including 3 credit hours in an Economics course above 3050. Students who are not sure whether they want to complete the Honors Program are urged to take an additional 3-credit-hour elective. Honors candidates are also required to write a senior thesis and to defend it in an oral examination. On satisfactory completion of this program, a student will graduate with honors or with highest honors in economics. Interested students who meet the College of Arts and Science's requirements for honors candidacy as set forth elsewhere in this catalog should consult the director of undergraduate studies no later than the fall term of their junior year.

### *Program of Concentration in Economics and History*

This is an interdisciplinary program split between Economics and History that provides a more focused program of study while requiring fewer credit hours than a double major in the two fields. The program consists of 45 credit hours of course work of which 9 credit hours are from a common economic history core and the remaining 36 credit hours are evenly divided between Economics and History. Students are expected to observe course-specific requirements in each department. The details are spelled out below under Economics and History.

### *Licensure for Teaching*

Candidates for teacher licensure in economics at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

**Course descriptions begin on page 155.**

## Economics and History

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The joint major in economics and history makes an important contribution to liberal education at Vanderbilt by helping students understand the origins and organization of modern society. It also provides a unique preparation for careers in business, the professions, and other fields by combining all the analytical tools of the regular economics major with history's emphasis on clear and effective writing and on developing skills in gathering, assessing, and synthesizing information. The program consists of 45 credit hours of course work: 9 credit hours in an economic history core, and an additional 18 credit hours in economics and 18 in history. Students declare their major through the Department of History office.

*Note:* All students must have at least one semester of calculus; two are strongly recommended for the economics component. Calculus is a prerequisite for ECON 1500, 1510, 3010, and 3020, which are required for the major. It is also a prerequisite for all economics courses numbered above 3000.

Course work for the major is distributed as follows:

### Economic History Core (9 credit hours)

Three of the following courses, one of which must be an economics course above 3000:

HIST 1600, 1640, 1650, 1660, 1665, 2138, 2660, 3075, 3190, 3200, ECON 2150, 3150, 3160. *Note:* ECON 3010 is a prerequisite for ECON 3150, and 3160.

### Economics (18 credit hours)

ECON 1010, 1020, 1500 or 1510, 3010, 3020; one ECON course above 3000 not included in the economic history core.

*Note:* The following course sequences may be substituted for ECON 1500 or 1510:

(1) MATH 2820, 2820L, and 2821 or

(2) MATH 2820, 2820L, and ECON 3050. ECON 3050 will also count as an elective.

### History (18 credit hours)

No more than 3 credit hours of AP or IB credit in history courses may count toward this total.

(1) History 3000W or 3980; must be taken by the end of the junior year. 3980 is limited to second-semester juniors who have been admitted to the Honors Program. Students entering the Honors Program who have already earned credit for 3000W will receive elective credit for that course.

(2) History 4960 (prerequisite: History 3000W), or History 4980–4981 (available only to students in the honors program). *Note:* At the discretion of the director of honors and the director of undergraduate studies in history, a student who has earned credit for 4980 but does not take 4981 may be considered to have fulfilled the capstone requirement for the major.

(3) Four other history courses not included in the economic history core. These electives may also include any of the following: AADS 2106, 2214, 2654, 4256; ASIA 2511, 2630; CLAS 2100, 2110, 2120, 2150, 2160, 2180, 3010; EUS 2201, 2208, 2220; DIV 6730, 6740; GER 2442; HOD 1115; JS 1111.09, 1200, 1220, 1240, 2450, 2540, 2560, 2600, 2620, 3000, 3100, 3210, 3892; MHS 2110; PHIL 2100; RLST 3306, 3316.

### Honors Program (9 more credit hours)

Students apply to the Honors Program in History in the first semester of the junior year.

54 credit hours: students will take the four-course honors sequence, HIST 3980, 4980–4981, 4999. Because HIST 4980–4981 satisfies the capstone requirement, honors students will not be required to take HIST 4960, though they may enroll for 4960 as an elective. Students will write an interdisciplinary thesis under the direction of an adviser from each department.

## English

CHAIR Dana D. Nelson

DIRECTOR OF UNDERGRADUATE STUDIES Julia Fesmire

DIRECTOR OF GRADUATE STUDIES Vera Kutzinski

DIRECTOR OF CREATIVE WRITING PROGRAM Kate Daniels

PROFESSORS EMERITI Vereen M. Bell, Paul Elledge, John Halperin, R. Chris Hassel Jr., Michael Kreyling, John F. Plummer III, Harold Lerow Weatherby Jr.

PROFESSORS Houston Baker, Robert Barsky, Jay Clayton, Kate Daniels, Colin (Joan) Dayan, Tony Earley, Lynn E. Enterline, Sam B. Girgus, Roy K. Gottfried, Mark Jarman, Vera Kutzinski, Jonathan Lamb, Leah S. Marcus, Lorrie Moore, Dana D. Nelson, Mark Schoenfield, Kathryn Schwarz, Hortense Spillers, Cecelia Tichi, Mark A. Wollaeger

ASSOCIATE PROFESSORS Jennifer Fay, Teresa A. Goddu, Rick Hilles, Lorraine Lopez, Ifeoma Nwankwo, Bridget Orr, Nancy Reisman, Allison Schachter, Rachel Teukolsky

ASSISTANT PROFESSORS Candice Amich, Christin Essin, Jessie Hock, Marzia Milazzo, Akshya Saxena, Haerin Shin, Ben Tran

PRINCIPAL SENIOR LECTURERS Julia Fesmire, Roger Moore

SENIOR LECTURERS John Bradley, Gabriel Briggs, Elizabeth Covington, Rory Dicker, Andrea Hearn, Scott Juengel, Elizabeth Meadows, Justin Quarry

WRITERS IN RESIDENCE Beth Bachmann, Piyali Battacharya, Amanda Little, Sandy Solomon

THE Department of English offers three distinct programs that allow students to individualize their studies while acquiring the breadth of knowledge and skills of the traditional English major. The curriculum provides courses in the history of British and American literature, in Anglophone literatures of other countries, in literary theory, and in expository as well as creative writing. These diverse courses reflect the interests of students and faculty and the expanding area of English literary study. Students use the concentration in English as a foundation for a variety of careers where the analytic, reading, and writing skills gained are especially valued, and as preparation for postgraduate work in literature. The department also regards its goals as helping students become readers of literature and culture throughout their lives.

Programs in England, Scotland, Australia, and around the world offer opportunities for study and travel that enrich a student's education. The Gertrude Vanderbilt and Harold S. Vanderbilt Visiting Writers series annually sponsors public lectures, readings, and other occasions where English majors hear and meet celebrated poets, novelists, and critics. Many majors write for and serve on the editorial boards of various campus publications including the *Hustler* paper and the *Vanderbilt Review*, a distinguished collection of creative writing. An English majors listserv alerts students to employment opportunities, internships, and study abroad programs in addition to those offered through Vanderbilt University.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in English and American Literature*

#### **Program I: Literary Studies (30 credit hours)**

Students pursue a broad range of interests through a flexible approach to the study of literature. 30 total credit hours including:

1. English 2200, Foundations of Literary Studies (3 credit hours)
2. 6 credit hours in History (literature before 1800)
3. 6 credit hours of Diverse Perspectives (ethnic American or Anglophone literature)
4. 3 credit hours in Approach
5. 9 additional credit hours of electives in English, chosen from the courses that count toward the major
6. English 4960, Senior Capstone Seminar (3 credit hours)

A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the requirement in numbers 2, 3, 4, and 5 above are described below under General Requirements and Advice for Majors and Minors in All Programs.

#### **Program II: Creative Writing (30 credit hours)**

Students develop their creative writing while acquiring an overview of English literature. 30 total credit hours including:

1. English 2200, Foundations of Literary Studies (3 credit hours)
2. 12 credit hours of 3000-level creative writing workshops in at least two different genres (from among: Nonfiction 3210, 3220; Fiction 3230, 3240; Poetry 3250, 3260). Admission to these courses is by consent of instructor.
3. 3 credit hours in History (literature before 1800)
4. 3 credit hours in Diverse Perspectives (ethnic American or Anglophone literature)
5. 9 credit hours from courses above 2000-level (except 2200) courses that count toward the English major, which may include one additional creative writing workshop (beyond the four required in number 2, above) or one course in another discipline (with approval of the director of undergraduate studies)

A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the requirement in numbers 2, 3, 4, and 5 above are described below under General Requirements and Advice for Majors and Minors in All Programs.

#### **Program III: Specialized Critical Studies (36 credit hours)**

Students design their own specialized course of study with a descriptive name and develop a contract of courses for it. 36 total credit hours including:

1. English 2200, Foundations of Literary Studies (3 credit hours)
2. 12 credit hours of course work concentrated in a particular period (e.g., nineteenth-century American), genre, or movement (e.g., the novel), an aspect of intellectual history (e.g., law and literature, literary theory), or other area of special interest. Up to 9 credit hours may be taken in courses from other departments relevant to the concentration. In consultation with a major adviser, each student selects specific courses, which are listed in a contract that is filed after the student has formally declared the major.
3. 6 credit hours in History (literature before 1800)
4. 6 credit hours in Diverse Perspectives (ethnic American or Anglophone literature)
5. 3 credit hours in Approach
6. English 4960, Senior Capstone Seminar, or 4998, Honors Colloquium (3 credit hours)
7. 3 credit hours of any English course above 2000, except 2200

A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the requirement in numbers 3, 4, and 5 above are described below under General Requirements and Advice for Majors and Minors in All Programs.

#### *Minor in English*

At least 18 credit hours of course work in English are required. These courses must include English 2200, 3 credit hours from History (literature before 1800), and 3 credit hours of Diverse Perspectives (ethnic American or Anglophone literature).

A course cannot be used to satisfy more than one requirement in the minor.

#### **General Requirements and Advice for Majors and Minors in All Programs**

Students must take English 2200 for the major, ideally during the freshman or sophomore year, or as soon as possible after declaring the major. All courses above 2050 (except 4999) count toward the major. English 3890, 3890W, 3892, 3892W, 3894, 3894W, and 3898 may be repeated for credit when the topics are different. The survey courses, 2310, 2311, 2316, and 2316W, are recommended for sophomores to provide a background for advanced courses. Students considering Program II (Creative Writing) may wish to take 1280 or 1290 as preparation during their freshman or sophomore year, although those courses will not count toward the major.

*Note:* A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the History requirement (literature before 1800) include 2310, 2318, 2318W, 3310, 3314, 3316, 3318, 3330, 3332, 3335, 3335W, 3336, 3337, 3340, 3340W, 3346, 3348, 3360, 3361, 3364, 3370.

Courses that fulfill the Diverse Perspectives requirement (ethnic American or Anglophone literature) include 3650, 3650W, 3654, 3654W, 3658, 3662, 3662W, 3664, 3670, 3670W, 3674, 3678, and appropriate courses from other departments as approved by the director of undergraduate studies.

Courses that fulfill the Approach requirement include 3710, 3711, 3720, 3720W, 3726, 3728, 3730, 3734, 3734W, 3740, 3742, 3744, 3746, 3748.

Courses that fulfill the Program II creative writing workshop requirement include 3210, 3220, 3230, 3240, 3250, 3260.

In addition, suitable sections of 3890, 3890W, 3892, 3892W, 3894, 3894W, 3746, 3898, 3898W, 4998, 4999, (as appropriate) and other courses may fulfill the categories listed. Detailed course descriptions appear on the Department of English website for the upcoming semester and are available in the department. Majors are required to consult with their advisers during registration to identify what specific requirements the courses offered in that semester might fulfill.

One course from another department, appropriate to the student's course of study, may be counted toward the requirements of any program with permission of the director of undergraduate studies; for Program III, this course may be in addition to the 9 credit hours already allowed from other departments.

### Honors Program

To graduate with honors in English, students must (a) complete all the requirements of the English major, with at least 6 credit hours in honors sections (an appropriate graduate seminar or seminar in a study abroad program may be substituted for one honors seminar); (b) 3 credit hours of 4998; (c) maintain at least a 3.4 grade point average overall and 3.6 in the major; (d) be admitted to the Honors Program in the spring of the junior year; (e) write a thesis (4999) and pass an oral examination about its subject in the spring of the senior year. For secondary education double-majors, EDUC 9700 can be substituted for 4999 with the consent of the director of undergraduate studies.

To comply with all requirements, every honors student will complete 33 credit hours. Exceptional achievement on the thesis will earn highest honors. Majors who wish to apply to the Honors Program must be within 6 credit hours of completing all AXLE requirements, must have made reasonable progress toward the major, and must have at least a 3.4 grade point average overall and 3.6 in the major. Applications are accepted in April of the junior year. Additional information is available from the director of undergraduate studies. Students need not be enrolled in the Honors Program to take honors sections. Honors sections are seminars open to any student beyond the freshman year who has completed the sophomore writing requirement of AXLE and has earned at least a 3.4 grade point average. Students are encouraged to enroll in honors sections prior to applying to the program.

### Licensure for Teaching

Candidates for teacher licensure in English at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Course descriptions begin on page 157.

## Environmental and Sustainability Studies

DIRECTOR David Hess

HUMAN beings and their societies necessarily interact with and alter the Earth's natural environment. The environmental and sustainability studies minor allows the student to examine human interaction with the environment from the perspectives of the humanities and social sciences with some exposure to the environmental sciences and/or environmental engineering.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Minor in Environmental and Sustainability Studies

Students who want to minor in environmental and sustainability studies must take a minimum of six courses (18 credit hours total) chosen from the courses listed below; additional relevant courses may be counted with approval of the director of the program. Courses must be distributed as follows: one science- and technology-intensive course (A); two humanities courses (B); two social-behavioral and policy-intensive courses (C); and a capstone course. No more than two courses may be at the 1000 level. In addition, no more than 3 credit hours may be counted simultaneously toward both the environmental and sustainability studies minor and any other major or minor. Topics courses may count toward the minor with approval of the director.

- A) *Natural Science- and Technology-Intensive Courses:* BSCI 1103, BSCI 2238, BSCI 2238L, BSCI 3233, EES 1030, EES 1070, EES 1080, EES 1111\*, EES 1510, EES 1510L, EES 2110, EES 2150, EES 3220, EES 3220W, EES 4650, EES 4680, EES 4750, EES 4760, EES 4820, ENVE 3610, ENVE 3611, ENVE 3612, ENVE 4615, ENVE 4700, ES 1115\*
- B) *Humanities Courses:* AMER 1111\*, AMER 4000\*, AMER 4100\*, ANTH 3138, ENGL 2316/2316W\*, ENGL 3720/3720W\*, ENGL 3730, ENGL 3898/3898W\*, HART 3240W, HART 2782, HIST 1470, HIST 1480, HIST 1520, PHIL 1111\*, PHIL 3611, PHIL 3612, RLST 2472, RLST 3921, WGS 2268, WGS 2270
- C) *Social-Behavioral Sciences and Policy Intensive Courses:* ANTH 1111\*, ANTH 2109, ANTH 2227, ANTH 3138, ANTH 3261, ANTH 3629, ANTH 4154, ECON 2170, HOD 3212, HOD 3890\*, PSCI 3253\*, PSY 1111\*, SOC 1020/1020W\*, SOC 1111\*, SOC 3311, SOC 3312, SOC 3313, SOC 3314, SOC 3315, SOC 3316, SOC 3317, SOC 3318, SOC 3321, WGS 1111\*
- D) *Capstone:* ENVS 4101 for minors only

\*Special topic and First-Year Writing Seminar sections require the approval of the director of the environmental and sustainability studies minor to count in the minor.

Course descriptions begin on page 161.

# European Studies

DIRECTOR Helmut W. Smith  
 MAX KADE VISITING PROFESSOR Frauke Berndt  
 PROFESSORS Robert Barsky, Michael Bess, Joy H. Calico  
 ASSOCIATE PROFESSORS Alexander Joskowicz, Meike Werner,  
 Christoph Zeller  
 ASSISTANT PROFESSOR Nina Warnke

## Affiliated Faculty

PROFESSORS EMERITI M. Donald Hancock (Political Science), John A. McCarthy (German)  
 PROFESSORS Celia Applegate (History), David Blackburn (History), W. James Booth (Political Science), William Caferro (History), Katherine B. Crawford (History), Cynthia Cyrus (Musicology), Robert Driskill (Economics), Lynn E. Enterline (English), James A. Epstein (History), Edward F. Fischer (Anthropology), Leonard Folgarait (History of Art), William P. Franke (Comparative Literature and Italian), Edward H. Friedman (Spanish), Marc Froment-Meurice (French), Lenn E. Goodman (Philosophy), Roy K. Gottfried (English), Barbara Hahn (German), Joel F. Harrington (History), Mark Jarman (English), Christopher M. S. Johns (History of Art), Lutz Koepnick (German), John Lachs (Philosophy), Leah S. Marcus (English), Thomas A. J. McGinn (History), Kelly Oliver (Philosophy), Philip D. Rasico (Spanish), Mark Schoenfield (English), Thomas A. Schwartz (History), Kathryn Schwarz (English), Virginia M. Scott (French), Holly A. Tucker (French), Mark A. Wollaeger (English), David C. Wood (Philosophy)  
 ASSOCIATE PROFESSORS George Becker (Sociology), Victoria Burrus (Spanish), Lauren Clay (History), Julia Cohen (Jewish Studies), Nathalie Debrauwere-Miller (French), Idit Dobbs-Weinstein (Philosophy), Jay Geller (Divinity School), Lisa Guenther (Philosophy), Shaul Kelner (Sociology and Jewish Studies), Richard Lloyd (Sociology), Andrea Mirabile (Italian), Letizia Modena (Italian), Elizabeth J. Moodey (History of Art), Anthère Nzabatsinda (French), Lynn Ramey (French), Michael A. Rose (Composition), Allison Schachter (Jewish Studies), Jeffrey S. Tlumak (Philosophy), Barbara Tsakirgis (Classical Studies), Francis W. Wcislo (History), Julian Wuerth (Philosophy), Andrés Zamora (Spanish)  
 ASSISTANT PROFESSORS James McFarland (German), Claudia Rei (Economics), Jason Strudler (Russian), William F. Robinson (History)  
 SENIOR LECTURERS Elena Olazagasti-Segovia (Spanish), Sheri F. Shaneyfelt (History of Art)  
 LECTURER David Johnson (Russian)

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Program of Concentration in European Studies

Designed for students who seek to broaden their awareness of the European experience and to prepare for international careers or advanced study, the Program in European Studies (EUS) offers disciplinary breadth as well as expertise in a specialty of students' choosing. Most EUS majors also participate in one of the Vanderbilt study abroad programs in Europe and/or reside in the International House on campus.

The interdisciplinary major consists of 42 credit hours of course work, to be distributed among various disciplines as indicated below. Emphasis is on political, cultural, economic, and related trends or events especially since the early modern period.

Advising is crucial to the successful completion of the major in EUS. In consultation with an adviser in European Studies, students choose a thematic focus and specific courses that will fulfill the requirements for the major. This focus can consist of a thematic or comparative topic (such as culture and society during a particular epoch), a regional or sub-regional topic (such as

European integration, the Iberian Peninsula, the Baltic region), or the culture and society of a particular nation (such as France, Germany, Italy, Poland, Spain). In addition to the core requirements, majors take relevant courses in history, social sciences, and the humanities, as well as a foreign language of the student's choice.

The Program in European Studies sponsors special activities including a visiting lecture series, international symposia, and informal faculty-student luncheon seminars. Both academic scholars and public figures are invited to campus to address European and transatlantic affairs.

### Required Core Courses (21 credit hours)

- EUS 2201, European Society and Culture (3 credit hours).
- EUS 2203, The Idea of Europe (3 credit hours).
- EUS 4960, Senior Tutorial (3 credit hours).
- 6 credit hours in Political Science, PSCI 2210, West European Politics, and PSCI 3211, The European Union, or appropriate substitute(s) with the approval of the EUS adviser.
- 6 credit hours in European history in the student's special interest area, to be selected from the list below and in consultation with the major adviser.

### Foreign Language Requirement (6 credit hours)

The foreign language requirement is to be satisfied in one of the following ways:

- 6 credit hours of course work beyond the intermediate level in one European language;
- course work through the intermediate level in two European languages;
- demonstration of proficiency equivalent to either of the preceding options; or
- participation in one of the Vanderbilt study programs in Europe (students participating in the Vanderbilt in England program must complete course work through the intermediate level in one European language, or demonstrate equivalent proficiency).

### Electives (15 credit hours)

The remainder of the 42 credit hours required for the major may be selected from the list of courses below or from among approved courses taken abroad. Students majoring in EUS are advised to select courses from the social sciences and humanities that complement their areas of special interest and their thematic focus. They should be distributed as follows:

- 3 additional credit hours in history
- 3 additional credit hours from other social science fields
- 9 credit hours from the humanities

### Other Issues Relating to the Major

Normally, no more than 6 credit hours of work in 1000-level courses may be counted toward the major; however, students with two languages through the intermediate level may also count toward the major the intermediate-level courses in one of those languages.

Independent study and research courses and selected topics courses should have topics appropriate to the student's course of study.

Students seeking a second major may count a maximum of 6 credit hours of course work to meet requirements in both majors.

### Joint Major Option

The Program in European Studies collaborates with several departments to create joint majors in French and European studies, German and European studies, Italian and European studies, Russian and European studies, Spanish and European studies, and Spanish, Portuguese, and European studies. These options are offered as collaborations between the Program in European Studies and the Departments of French and Italian, Germanic and Slavic Languages, and Spanish and Portuguese. Please see the detailed information on the joint major options under the departmental headings in this catalog. Students selecting one of these options will be advised by their major adviser in the language department as well as their adviser in the Program in European Studies.

### Honors Program

The Program in European Studies offers qualified majors the option of completing a portion of their major requirements in an Honors Program. Students engage in interdisciplinary reading, consultations with faculty, and research on the overarching theme of their program of concentration. To be admitted to the program students must have attained a minimum cumulative grade point average of 3.300 and a minimum grade point average of 3.300 in all courses that count toward the EUS major; identify an adviser for the thesis; submit a detailed description of their proposed program of study for approval of the director of EUS; complete 3 credit hours of independent research (normally EUS 4998); complete 3 credit hours of credit in EUS 4960, Senior Tutorial, that involves researching and writing a senior honors thesis of approximately fifty pages and that reveals an interdisciplinary perspective; successfully defend the honors thesis before a committee normally consisting of the adviser, the director of EUS, and another EUS faculty member.

Information concerning the Honors Program is available from the director of EUS. College regulations governing honors programs may be found in this catalog under Honors Programs, Special Programs for Arts and Science.

### The Minor in European Studies

The EUS minor is a logical complement to a major in anthropology, history, economics, literary studies, philosophy, and political science. It involves 18 credit hours of course work with concentration and distribution requirements similar to those for the major, but on a reduced scale. A background in a modern foreign language is highly recommended. Students choose a thematic focus and take approved European content courses distributed as follows:

- EUS 2201, European Society and Culture
- EUS 2203, The Idea of Europe
- 3 additional credit hours selected from EUS-labeled courses (or approved substitute)
- a minimum of 3 credit hours of modern European history
- a minimum of 3 credit hours of relevant work in social science
- a minimum of 3 credit hours of relevant work in humanities

The minimum number of credit hours required for the minor is 18.

### List of Approved Courses with European Content

Because the curricular offerings are constantly changing, prospective majors and minors should consult with the director about appropriate substitutes for courses listed below.

#### European History

EUROPEAN STUDIES: 2208, Conspiracy Theories and Rumors in European and U.S. History; 2220, Religion and Politics in Modern Europe, 1648–Present; 2240, Topics in European Studies; 2260, European Cities.

HISTORY: 1111-08, European Imperialism: Colonizer and Colonized in the Modern World; 1350, Western Civilization to 1700; 1360, Western Civilization since 1700; 1390, America to 1776: Discovery to Revolution; 1480, The Darwinian Revolution; 1500, History of Modern Sciences and Society; 1510, The Scientific Revolution; 1580, Crime and Punishment in Early Modern Europe 1400–1800 CE; 1600, European Economic History, 1000–1700; 1700, Western Military History to 1815; 1730, The U.S. and the Cold War; 1760, History of Christian Traditions; 2130, Russia: Old Regime to Revolution; 2135, Russia: The U.S.S.R. and Afterward; 2220, Medieval and Renaissance Italy, 1000–1700; 2230, Medieval Europe, 1000–1350; 2250, Reformation Europe; 2260, Revolutionary Europe, 1789–1815; 2270, Nineteenth-Century Europe; 2280, Europe, 1900–1945; 2290, Europe since 1945; 2300, Twentieth-Century Germany; 2310, France: Renaissance to Revolution; 2340, Modern France; 2380, Shakespeare's Histories and History; 2382, The Rise of the Tudors; 2383, A Monarchy Dissolved? From Good Queen Bess to the English Civil War; 2385, The Real Tudors; 2410, Victorian England; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2595W, The English Atlantic World, 1500–1688; 2720, World War II; 2800, Modern Medicine; 2835, Sexuality and Gender in the Western Tradition to 1700; 2840, Sexuality and Gender in the Western Tradition since 1700; 3010, Pornography and Prostitution in History; 3120, Weimar Germany: Modernism and Modernity, 1918–1933; 3150, Cities of Europe and the Middle East; 3180, Making of Modern Paris; 3230, The Art of Empire; 3260, Revolutionary England, 1603–1710; 3270, Religion and the Occult in Early Modern Europe; 3275, Religion and Popular Culture in Nineteenth-Century Europe.

JEWISH STUDIES: 1002, Introduction to Jewish Studies; 1002W, Introduction to Jewish Studies; 1200, Classical Judaism: Jews in Antiquity; 1220, Jews in the Medieval World; 1240, Perspectives in Modern Jewish History; 2250W, Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors; 3100, The Holocaust.

#### Social Sciences

ANTHROPOLOGY: 3371, Social and Health Consequences of Pandemics.

ECONOMICS: 2240, Russia in the World Economy; 3160, Economic History of Europe; 3180, History of Economic Thought; 3600, International Trade; 3610, International Finance.

EUROPEAN STUDIES: 2240, Topics in European Studies; 2800, Pursuing Utopia: Social Justice & Romanticism in the Alps.

POLITICAL SCIENCE: 1101, Introduction to Comparative Politics; 1102, Introduction to International Politics; 1103, Justice; 2202, Ancient Political Thought; 2203, History of Modern Political Philosophy; 2210, West European Politics; 2220, Crisis Diplomacy; 2221, Causes of War; 2223, European Political Economy and Economic Institutions; 2225, International Political Economy; 2226, International Law and Organization; 2274, Nature of War; 4238, Comparative Political Parties; 3211, The European Union.

SOCIOLOGY: 3851, Independent Research and Writing (with appropriate topic); 4961, Seminars in Selected Topics (with appropriate topic).

#### Humanities

CLASSICS: 3120, Humor, Ancient to Modern.

COMMUNICATION STUDIES: 3600, The Rhetorical Tradition.

ENGLISH: 1111, First-Year Writing Seminar (with appropriate topic); 2310, British Writers to 1660; 2311, British Writers 1660–Present; 3310, Anglo-Saxon Language and Literature; 3314, Chaucer; 3316, Medieval Literature; 3330, Sixteenth Century; 3332, English Renaissance: The Drama; 3335W, English Renaissance Poetry; 3336, Shakespeare: Comedy and Histories; 3337, Shakespeare: Tragedy and Romance; 3340, Shakespeare: Representative Selections; 3340W, Shakespeare: Representative Selections; 3346, Seventeenth-Century Literature; 3348, Milton; 3360, Restoration and the Eighteenth Century Early; 3361, Restoration and Eighteenth Century Late; 3364, The Eighteenth-Century English Novel; 3370, The Bible in Literature; 3610, The Romantic Period; 3611, The Romantic Period; 3614, The Victorian Period; 3618, The Nineteenth-Century English Novel; 3630, The Modern British Novel; 3634, Modern Irish Literature; 3640, Modern British and American Poetry: Yeats to Auden; 3681, Twentieth-Century British and World Drama; 3683, Contemporary British Literature; 3740, Critical Theory; 3890, Movements in Literature (with appropriate topic); 2890W, Movements In Literature (with appropriate topic); 3892, Problems in Literature (with appropriate topic); 3892W, Problems in Literature (with appropriate topic); 3894, Major Figures in Literature (with appropriate topic); 3894W, Major Figures In Literature (with appropriate topic); 3898, Special Topics in English and American Literature (with appropriate topic); 3898W, Special Topics In English and American Literature (with appropriate topic).

EUROPEAN STUDIES: 2240, Topics in European Studies; 2260, European Cities; 2800, Pursuing Utopia: Social Justice & Romanticism in the Alps.

FRENCH: 2501W, French Composition and Grammar; 2614, Advanced Conversational French; 3101, Texts and Contexts: Middle Ages to the Enlightenment; 3102, Texts and Contexts: Revolution to the Present; 3111, French for Business; 3113, Advanced French Grammar; 3180, La Provence; 3181, Contemporary France; 3188, The Contemporary Press and Media; 3222, The Early Modern Novel; 3223, The *Querelles des femmes*; 3224, Medieval French Literature; 3230, French and Francophone Cinema; 3242, Dante and the Foundations of Modern Western Civilization; 3281, Provence and the French Novel; 3286, Cultural Study Tour; 3620, Age of Louis XIV; 3621, Enlightenment and Revolution; 3622, From Romanticism to Symbolism; 3623, The Twentieth-Century Novel; 4025, From Carnival to the “Carnavalesque”; 4027, Emile Zola: From Naturalist Novels to Social Activism; 4029, Twentieth-Century French Literature; 4030, French and Italian Avant-garde; 4221, Literature of the Fantastic; 4232, Literature and Law; 4284, Art and Literature of the Nineteenth Century; 4285, Art and Literature of the Twentieth Century; 4320, French Feminist Thought: Literary and Critical; 4322, Adultery and Transgressions in Literature; 4432, French Intellectual History.

GERMAN: 1111, First-Year Writing Seminar; 1482, Borders and Crossings: German Literature and Culture from Romanticism to the Present; 2216, Business German; 2310W, Introduction to German Studies; 2320, Conversation and Composition: Current Events; 2321, Conversation and Composition: Contemporary Culture; 2341, German Culture and Literature; 2342, German Culture and Literature; 2441, Great German Works in English; 2442, War on Screen; 2443, German Cinema: Vampires, Victims, and Vamps; 2444, German Fairy Tales from Brothers Grimm to Walt Disney; 2445, Nazi Cinema: The Manipulation of Mass Culture; 3323, From Language to Literature; 3343, The Aesthetics of Violence: Terror, Crime, and Dread in German Literature; 3344, Women at the Margins: German-Jewish Women Writers; 3345, Love and Friendship; 3375, Art and Rebellion: Literary Experiment in the 1960s and 1970s; 3378, Dreams in Literature; 4535, German Romanticism; 4537, Women and Modernity; 4548, German Lyric Poetry—Form and Function; 4563, The Age of Goethe-Weimar 1775 to 1805; 4564, Pleasures and Perils in Nineteenth-Century Theatre; 4565, Revolutionizing Twentieth-Century Theatre; 4566, Nineteenth-Century Prose; 4567, The German Novel from Kafka to Grass; 4569, Writing under Censorship; 4574, Who Am I? German Autobiographies; 4576, Tales of Travel in Modern German Culture.

HISTORY OF ART: 1100, History of Western Art I; 1110, History of Western Art II; 1111, First-Year Writing Seminar (with appropriate topic); 2220, Greek Art and Architecture; 2270, Early Christian and Byzantine Art; 2285, Medieval Art; 2310, Italian Art to 1500; 2320W, The Italian Renaissance Workshop; 2325, Great Masters of the Italian Renaissance; 2330, Italian Renaissance Art after 1500; 2360, Northern Renaissance Art; 2362, Fifteenth-Century Northern European Art; 2390, Seventeenth-Century Art;

2600, Eighteenth-Century Art; 2620, Nineteenth-Century European Art; 2622, Neoclassicism and Romanticism; 2650, Nineteenth-Century Architecture: Theory and Practice; 2652, French Art in the Age of Impressionism; 2680, British Art: Tudor to Victorian; 2708, Twentieth-Century British Art; 2710, Twentieth-Century European Art; 2720, Modern Architecture; 2722, Modern Art and Architecture in Paris; 3224, Greek Sculpture; 3226, Greek Vases and Society; 3228W, Gender and Sexuality in Greek Art; 3274, Art and Empire from Constantine to Justinian; 3320, Early Renaissance Florence; 3320W, Early Renaissance Florence; 3332, Raphael and the Renaissance; 3334, Michelangelo's Life and Works; 3334W, Michelangelo's Life and Works; 3364W, The Court of Burgundy; 3366, 16th-Century Northern European Art.

ITALIAN: 1111, First-Year Writing Seminar: Italian History and Culture Through Cinema; 2203, Italian Journeys; 2501W, Grammar and Composition; 2614, Conversation; 3000, Introduction to Italian Literature; 3100, Literature from the Middle Ages to the Renaissance; 3041, Italian Civilization; 3100, Literature from the Middle Ages to the Renaissance; 3240, Dante's *Divine Comedy*; 3242, Dante in Historical Context; 3340, *Famous Women* by Boccaccio; 3500, Baroque, Illuminismo, and Romanticism in Italy; 3600, Twentieth-Century Literature: Beauty and Chaos; 3640, Classic Italian Cinema; 3641, Contemporary Italian Cinema; 3701, City Fictions; 3702, Topics in Contemporary Italian Civilization; 3802, Contemporary Italian Society and Culture.

JEWISH STUDIES: 2210W, Hebrew Literature in Translation; 2250W, Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors; 2270, Jewish Storytelling; 2270W, Jewish Storytelling; 2320, Freud and Jewish Identity; 2340, Jewish Philosophy after Auschwitz; 2450, The Jewish Diaspora; 2640, Jews and Greeks.

MUSIC LITERATURE: 1220, The Symphony; 1230, Survey of Choral Music; 2200W, Music in Western Culture; 3220, Opera in the 17th and 18th Centuries; 3221, Opera in the 19th Century; 3222, Mahler Symphonies: Songs of Irony; 3223, Music in the Age of Beethoven and Schubert; 3224, Haydn and Mozart; 3225, Brahms and the Anxiety of Influence; 3227, Music in the Age of Revolution, 1789–1848; 3228, J. S. Bach: Learned Musician and Virtual Traveler; 3229, Robert Schumann and the Romantic Sensibility; 3890, Selected Topics in Music History (with appropriate topic).

PHILOSOPHY: 1111, First-Year Writing Seminar (with appropriate topic); 1200, The Meaning of Life; 1200W, The Meaning of Life; 2102, Medieval Philosophy; 2103, Modern Philosophy; 2104 Nineteenth-Century Philosophy; 2109, Twentieth-Century Continental Philosophy; 2110, Contemporary Philosophy; 2660, Philosophy of Music; 3005, Jewish Philosophy; 3007, French Feminism; 3009, Existential Philosophy; 3010, Phenomenology; 3011, Critical Theory; 3013, History of Aesthetics; 3014, Modernist Aesthetics; 3103, Immanuel Kant; 3104, Kierkegaard and Nietzsche; 3602, Philosophy of History; 3620, Political and Social Philosophy; 3621, Early Modern Political Philosophy; 3622, Contemporary Political Philosophy; 3623, Modern Philosophies of Law.

PORTUGUESE: 2203, Intermediate Portuguese; 3301, Portuguese Composition and Conversation; 3892, Special Topics in Portuguese Language, Literature, or Civilization (with appropriate topic).

RELIGIOUS STUDIES: 1111, First-Year Writing Seminar (with appropriate topic); 1820, Religion, Sexuality, Power; 2210W, Constructions of Jewish Identity in the Modern World; 2940, Great Books of Literature and Religion; 3229, The Holocaust: Its Meanings and Implications; 3316, Christianity in the Reformation Era; 3940, The Nature of Evil; 3941, Religion, Science, and Evolution; 4834, Post-Freudian Theories and Religion; 4835, Freudian Theories and Religion.

RUSSIAN: 1111, First-Year Writing Seminar; 1171, A Tale of Three Cities; 1172, Russian Culture in the Twentieth Century; 1190, Russian and Soviet Short Story; 1874, Russian Fairy Tales; 1910W, 19th Century Russian Literature; 2232, The Evil Empire: Stalin's Russia; 2240, Terrors and Terrorists: Russian Literature of the Irrational and the Absurd; 2273, Russian Science Fiction; 2310, Survey of Russian Literature in English Translation; 2311, Survey of Russian Literature in English Translation; 2434, The Russian Cinema; 2435, Leo Tolstoy: *Anna Karenina* and Other Masterpieces; 2438, Dostoevsky's Major Novels: Philosophy and Aesthetics; 2537, Vladimir Nabokov;



2639, The Story of Siberia; 2745, Art After Zero: The Russian Avant-Garde; 3231, Jews in Russian Culture: Survival and Identity; 3250, Socio-Political and Cultural Developments in Post-Soviet Regions; 3301, Composition and Conversation; 3302, Composition and Conversation.

SPANISH: 1111, First-Year Writing Seminar: Travel Matters; 2990, Images of the Feminine in Spanish Cinema; 3301W, Intermediate Spanish Writing; 3302, Spanish for Oral Communication through Cultural Topics; 3325, The Way of Saint James; 3340, Advanced Conversation; 3345, Spanish for Business and Economics; 3355, Advanced Conversation through Cultural Issues in Film; 3360, Spanish Civilization; 3365, Film and Recent Cultural Trends in Spain; 4345, The Languages of Spain; 4400, The Origins of Spanish Literature; 4405, Literature of the Spanish Golden Age; 4410, Spanish Literature from the Enlightenment to 1900; 4415, Spanish Literature from 1900 to the Present; 4440, Development of the Short Story; 4445, Development of the Novel; 4450, The Contemporary Novel; 4455, Development of Drama; 4465, Theory and Practice of Drama; 4470, Development of Lyric Poetry; 4475, Contemporary Lyric Poetry; 4620, Love and Honor in Medieval and Golden Age Literature; 4640, *Don Quixote*; 4670, Spanish Realism; 4690, Alterity and Migration in Spain.

WOMEN'S AND GENDER STUDIES: 1272, Feminism and Film.

Course descriptions begin on page 161.

## Film Studies

See Cinema and Media Arts

## French and Italian

CHAIR Laurel Schneider

DIRECTOR OF UNDERGRADUATE STUDIES IN FRENCH

Susan Kevra

DIRECTOR OF UNDERGRADUATE STUDIES IN ITALIAN

Andrea Mirabile

DIRECTOR OF GRADUATE STUDIES Paul B. Miller

PROFESSORS EMERITI Barbara C. Bowen, Dan Church, Patricia A. Ward, Ruth G. Zibart

PROFESSORS Robert Barsky, William Franke, Marc Froment-Meurice,

Virginia M. Scott, Tracy Sharpley-Whiting, Holly A. Tucker

ASSOCIATE PROFESSORS Nathalie Debrauwere-Miller, Andrea Mirabile,

Letizia Modena, Anthere Nzabatsinda, Lynn Ramey

ASSISTANT PROFESSORS Elsa Filosa, Paul B. Miller

SENIOR LECTURERS Nathalie Dieu-Porter, Susan Kevra

LECTURERS Jessica Greenfield, Rebecca Peterson, Daniel Ridge,

Caterina Messina

THE Department of French and Italian offers a wide range of courses in the language, culture, and literatures of Italy, France, and other Francophone communities. Most language, literature, and culture courses are taught in French or Italian. Students may use courses in both French and Italian to satisfy some requirements of AXLE.

The Department offers a program of concentration in French as well as two interdisciplinary programs: a concentration in French and European studies and a concentration in Italian and European studies. Qualified French majors may also participate in the Honors Program in French. Minors in French and Italian are offered. On the graduate level, the department offers a doctoral program in French.

Many students participate in the Vanderbilt in France program in Aix-en-Provence or the Italian study abroad program in Sienna, Italy. The department offers Maymester programs in France, Italy, and Switzerland. On-campus activities include films, symposia, concerts, and lectures by visiting professors. The department has chapters of national honor societies for both French and Italian students. Students may also apply to live on the French Hall in McTyeire International House.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in French

Students who choose to major in French are expected to achieve advanced proficiency in oral and written French (Communications), to demonstrate a general understanding of the history of French and Francophone literatures and cultures (Traditions), and to develop an awareness of the ways French and Francophone studies intersect with other disciplines (Intersections). Of the 36 credit hours required for the major, 30 credit hours must be taken in French; 6 credit hours may be taken in a relevant area outside the department with adviser approval and may satisfy the requirement in Intersections. No more than 6 credit hours of AP or IB credit may count toward this total (3 credit hours for 2501W and 3 credit hours of "no equivalent" credit). All majors are strongly urged to spend a semester or a year studying at Vanderbilt in France.

Course work for the major is distributed as follows:

*Required courses (9 credit hours):* 2501W, 3101, 3102

*Two courses from Communications (6 credit hours):* 2550W, 2611, 2614, 2891, 3111, 3112, 3113

*Three courses from Traditions (9 credit hours):* 3180, 3181, 3222, 3223, 3224, 3281, 3620, 3621, 3622, 3623, 3891, 4023, 4025, 4027, 4029, 4221, 4320, 4322

*Four courses from Intersections (12 credit hours):* 3188, 3230, 3232, 3234, 3788, 3789, 3881, 3892, 4030, 4232, 4284, 4285, 4430, 4432 (Two courses in related fields will count in this category.)

All majors should consult their advisers about their choice of major courses each semester.

### Honors Program in French

In addition to requirements set by the College of Arts and Science, the following requirements must be met:

1. All the requirements for the 36-credit-hour major in French.
2. One graduate-level French course during the senior year for at least 4 credit hours; this course may substitute for one 3000- or 4000-level course required for the major.
3. A minimum of one semester of study (or the summer session) at Vanderbilt in France or at an approved substitute program in a French-speaking country.
4. 3.5 grade point average in French.
5. Completion of a senior honors thesis, under the direction of a faculty adviser.
6. 6 credit hours of thesis credit under French 4998 and 4999 (Senior Honors Thesis).
7. An oral examination on the thesis and its area in the last semester of the senior year.

A three-member Honors Committee will administer the program. Students must submit the name of the faculty adviser and the proposed thesis topic to this committee for approval during the second semester of the junior year. The committee will set guidelines for the thesis topic proposal, publish deadlines each year, and administer the oral examination.

### *Program of Concentration in French and European Studies*

Students may elect this interdisciplinary major, which requires a minimum of 42 credit hours of course work. A semester of study at Vanderbilt in France or at an affiliated program in Paris is required. Course work for the joint major is distributed as follows (all courses for the French side must be in French):

#### **French (24 credit hours)**

*French Language, Literature, and Culture (9 credit hours):*

2501W, 3101, 3102

*Communications (6 credit hours):* 2550W, 2611, 2614, 2891,

3111, 3112, or 3113

*Traditions (6 credit hours):* 3180, 3181, 3222, 3223, 3224, 3281, 3620, 3621, 3622, 3623, 3891, 4023, 4025, 4027, 4029, 4221, 4320, or 4322

*Intersections (3 credit hours):* 3188, 3230, 3232, 3234, 3730, 3788, 3789, 3881, 3892, 4030, 4232, 4284, 4285, 4430, or 4432

#### **European Studies (18 credit hours)**

*European Studies core courses (9 credit hours):* EUS 2201, 2203, 4960 (requires thesis)

*Social Science (6 credit hours):* PSCI 3897 when offered in Aix, approved alternative course at IEP at Aix as approved by the director of undergraduate studies in French (course must be in French), PSCI 2210, PSCI 3211, or appropriate substitute from any other social studies discipline with approval of the director of European Studies

*European History (3 credit hours):* HIST 2230, 2250, 2260, 2270, 2280, 2290, 2310, 2340, or approved course in consultation with the director of European Studies

### *Minor in French*

The minor in French requires 18 credit hours of 2000- or higher-level course work, including 2501W, 3101, and 3102. All minors are expected to consult their advisers about their choice of courses. No course taught in English may count toward the minor. Students are encouraged to participate in the Vanderbilt in France program.

### *Minor in Italian Studies*

Students who minor in Italian studies are expected to achieve intermediate proficiency in oral and written Italian, to demonstrate a general understanding of the history of Italian literatures and cultures, and to develop an awareness of the ways Italian studies intersects with other disciplines. The minor in Italian studies requires 15 credit hours of course work, including:

*Required courses (6 credit hours):*

ITALIAN: 2203, Italian Journeys (prerequisite ITA 1102; ITA 1103, or equivalent); either 2501W, Grammar and Composition (prerequisite ITA 2203 or equivalent), or 2614, Conversation (prerequisite ITA 2203 or equivalent). ITA 1101, 1102, 1103 do not count toward the minor.

*Elective courses (9 credit hours).* Only 3 of these elective credit hours may be selected from courses in subject areas other than

Italian, such as Classical Studies, History, History of Art, Music Literature, and History:

ITALIAN: 2501W, Grammar and Composition (if not used as a required course); 2614, Conversation (if not used as a required course); 3000, Introduction to Italian Literature; 3041, Italian Civilization; 3100, Literature from the Middle Ages to the Renaissance; 3240, Dante's *Divine Comedy*; 3340, *Famous Women* by Boccaccio; 3500, Baroque, Illuminismo, and Romanticism in Italy; 3600, Twentieth-Century Literature: Beauty and Chaos; 3640, Classic Italian Cinema; 3641, Contemporary Italian Cinema; 3701, City Fictions; 3702, Topics in Contemporary Italian Civilization; 3740, Gangsters, Lovers, Madonnas, and Mistresses; 3802, Contemporary Italian Society and Culture; 3890, Special Topics in Italian Literature.

CLASSICAL STUDIES: LAT 3100, Roman Comedy; LAT 3110, Catullus; LAT 3120, Lucretius: *De Rerum Natura*; LAT 3130, Vergil: *The Aeneid*; LAT 3160, Ovid.

HISTORY: 2220, Medieval and Renaissance Italy, 1000–1700.

HISTORY OF ART: 2310, Italian Art to 1500; 2330, Italian Renaissance Art after 1500; 3320, 3320W, Early Renaissance Florence; 3332, Raphael and the Renaissance; 3334, 3334W, Michelangelo's Life and Works.

MUSIC LITERATURE: 3220, Opera in the 17th and 18th Centuries; 3221, Opera in the 19th Century.

Other Italy-related courses not listed here—such as those in study abroad programs—may be approved towards the minor upon approval by the director of undergraduate studies in Italian. Students are encouraged to attend Vanderbilt in Italy.

### *Program of Concentration in Italian and European Studies*

The joint major in Italian and European Studies acknowledges the cultural, political, and strategic importance of Italy within the community of European nations. It requires 42 credit hours of course work; a semester of study in Italy is recommended. Prospective majors should consult with the director of undergraduate studies in Italian and with the director of the European Studies program. Course work for the joint major is distributed as follows:

#### **Italian (24 credit hours)**

*Italian language and literature — 12 credit hours from the following courses:* ITA 2203 (requires ITA 1102 or 1103), 2501W, 3000, 3100, 3240, 3340, or 3500. 2501W is prerequisite for 3000, 3100, and 3500. (Note: 1000-level Italian language courses do not count toward the major.)

*Modern cultural intersections — 12 credit hours from the following courses, of which at least 6 credit hours must be taken in Italian:* ITA 2614, 3041, 3600, 3640, 3641, 3701, 3702, 3740, or 3802.

#### **European Studies (18 credit hours)**

*European Studies core courses — 9 credit hours:* EUS 2201, 2203, and 4960 (requires thesis).

*Social Science — 3 credit hours from the following courses:* PSCI 2210, 3211, or appropriate substitute with the approval of the director of the European Studies program.

*History — 3 credit hours from the following courses:* HIST 2260, 2270, 2280, or 2290.

*Humanities — 3 credit hours from the following courses:* EUS 2240, 2260; HART 2310 or 2330.

## Licensure for Teaching

Candidates for teacher licensure in French at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

## French

Students who have not studied French in high school should begin their studies at Vanderbilt in French 1101. Students with high school French on their records must present a College Board achievement test score in French to be placed correctly. Students should consult their advisers or the Department of French and Italian for advice on placement.

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 162.**

## Italian

Students who have not studied Italian in high school should begin their studies at Vanderbilt in Italian 1101.

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 177.**

# Germanic and Slavic Languages

CHAIR Lutz Koepnick  
 DIRECTOR OF UNDERGRADUATE STUDIES IN GERMAN Lilla Balint  
 DIRECTOR OF UNDERGRADUATE STUDIES IN RUSSIAN Jason Strudler  
 DIRECTOR OF GRADUATE STUDIES Christoph Zeller  
 PROFESSORS EMERITI Konstantin V. Kustanovich, John A. McCarthy,  
 Richard Porter  
 PROFESSORS Barbara Hahn, Lutz Koepnick  
 DISTINGUISHED MAX KADE VISITING PROFESSOR Frauke Berndt  
 ASSOCIATE PROFESSORS Meike G. Werner, Christoph Zeller  
 ASSISTANT PROFESSORS Lilla Balint, James McFarland  
 MELLON ASSISTANT PROFESSOR Jason Strudler  
 LECTURERS David Matthew Johnson, Silke Schade

THE Department of Germanic and Slavic Languages offers a broad array of courses taught in German, Russian, or English on a wide variety of topics related to these languages, cultures,

histories, and societies. For students who want to engage with German or Russian culture in a more substantive way, the department offers programs of concentration in German and in Russian.

The department sponsors lectures on topics related to German and Russian society and culture, films, symposia, and other German- and Russian-themed activities. Students are encouraged to apply for living space in McTyeire International House in the German and Russian sections, and German majors with sufficient academic qualifications are invited to join Delta Phi Alpha, the National German Honor Society.

Many students majoring in German enroll in study abroad programs in Germany or Austria, and/or the Vanderbilt in Berlin Program in conjunction with the Free University in Berlin. Less formal activities, such as a weekly Kaffeestunde, Mahlzeit (lunchtime conversations) or the Stammtisch at a local pizza parlor, are also open to undergraduates. For further information, please see [as.vanderbilt.edu/german/](http://as.vanderbilt.edu/german/).

The Russian program has a special commitment to undergraduate training in all aspects of Russian culture and language. Thus, students are able to pursue their particular interests within the Russian program while simultaneously being held to a measurable standard. For further information, please see [as.vanderbilt.edu/russian/](http://as.vanderbilt.edu/russian/).

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Program of Concentration in German (Track I)

Students majoring in German demonstrate advanced proficiency in oral and written German, as well as detailed understanding of significant aspects of German-speaking cultures, histories, and societies by the successful completion of at least two courses above 2441 taught in German. Students are required to complete a total of 30 credit hours of course work beyond GER 1102, including the following:

Core course: 2441	3
German language in context: 6 credit hours of 2201, 2202, 2281, 2282, 2320, 2321	6
German culture and history: 6 credit hours in 2310W, 2341, 2342	6
Electives: No fewer than 15 additional credit hours of course work in the GER subject area or approved by the DUS in German; no more than 6 credit hours of which may be in courses taught in English; at least 9 credit hours above 2441	15
<b>Total hours:</b>	<b>30</b>

Students are permitted to count a maximum of 6 credit hours of instruction in courses outside the GER subject area toward the major, with the approval of the DUS of German. First-Year Writing Seminars offered in the GER subject area or approved by the DUS count toward electives in the major, and toward the 6 credit hour total of instruction in English. Up to 6 credit hours either earned through AP exams or transferred from other institutions may count toward the major.

## German Language Proficiency

In addition, students majoring in German will be tested for language proficiency during their junior year and will be required to write a senior paper due the semester prior to

graduation. The director of undergraduate studies in German should be consulted for details on these special learning outcome assessments.

### *Honors Program (Track II)*

Candidates for honors in German who meet College of Arts and Science and departmental requirements must complete all requirements for the concentration in German. In addition, students

- must study a minimum of one semester at a German-speaking university (or gain the equivalent experience);
- complete 6 credit hours of 7000-level (graduate) courses beyond the basic course requirement;
- maintain at least a 3.30 cumulative GPA in courses that count toward the German major and a 3.30 cumulative GPA;
- write an honors thesis and pass an oral examination during their final semester.

### *Minor in German*

A minor in German documents a student's basic competence in the German language as well as familiarity with German-speaking culture. Students can fulfill the requirements of a minor concentration in German by taking GER 2441, and 15 credit hours in the GER subject area, of which 6 credit hours must be earned in courses taught in the German language, for a total of 18 credit hours.

### *Vanderbilt in Berlin*

The seven-week, 7-credit-hour Vanderbilt in Berlin summer program offers students an opportunity to study German, improve German-language skills, and take courses in English and German. This program is also open to students with no prior knowledge of German. Students participate in a week-long orientation course on the history and culture of Berlin (1 credit hour), then take two six-week courses (6 credit hours) or one intensive language course (6 credit hours). All courses include regular excursions to course-related locations. A limited number of scholarships are available.

### *Goethe-Institut Certificate in Business German*

Students completing GER 2216 may take an examination at a Goethe-Institut to obtain the Bulats Deutsch-Test für den Beruf, a certificate in business German recognized by businesses worldwide. Further information is available on the Goethe-Institut website: [goethe.de/en/spr/kup/prf/prf/bul.html](http://goethe.de/en/spr/kup/prf/prf/bul.html).

### *Program of Concentration in German and European Studies*

Students pursuing the interdisciplinary major in German and European studies combine their focus on German language and literature with a study of modern Europe in its political, economic, and cultural diversity. The German and European studies joint major consists of a minimum of 42 credit hours of course work. A semester of study abroad in the Vanderbilt in Germany program is recommended. Course work for the major is distributed as follows:

### **German (24 credit hours)**

*Introduction to German Studies (3 credit hours):* GER 2301W  
*German language and culture (3 credit hours):* GER 2320 or 2321

*German civilization (6 credit hours):* GER 2341, 2342  
*German literature and culture (12 credit hours):* GER 3323, 3343, 3375, 3378, 4535, 4548, 4550, 4560, 4563, 4564, 4565, 4566, 4569, 4574, or appropriate substitute approved by the director of undergraduate studies in German

### **European Studies (18 credit hours)**

*European Studies core courses (9 credit hours):* EUS 2201, 2203, and 4960 (requires thesis)

*Social Science (3 credit hours):* PSCI 2210, 3211 or appropriate substitute with the approval of the EUS adviser

*History (3 credit hours):* HIST 2720, 2260, 2270, 2280, 2290, 2300, or other appropriate course selected in consultation with the EUS adviser

*Humanities (3 credit hours):* EUS 3890, 2260 (Berlin or Vienna) or other appropriate course selected in consultation with the EUS adviser

### *Program of Concentration in Russian*

Requirements for a concentration in Russian include a minimum of 30 credit hours of course work. Required courses are RUSS 1101–1102, RUSS 2201–2202 (18 credit hours), and one English-language course with the RUSS subject code (3 credit hours; see the list of qualifying courses below). The remaining 9 credit hours may be earned either from Russian- and English-language courses with the RUSS subject code (see the list of qualifying courses below) or from other relevant courses that will be approved by the director of undergraduate studies on a case-by-case basis. A maximum of 6 credit hours toward the concentration in Russian may be earned from courses taken from other U.S. institutions or through study abroad programs. AP and IB exam credit will not count toward credit hours required for the concentration, but placement exams will be offered for RUSS 1101 and/or 1102. Students concentrating in Russian will be expected to take an “assessment exam” via colloquium prior to graduation.

### *Minor in Russian*

Requirements for a minor in Russian include a minimum of 19 credit hours of course work. Required courses are RUSS 1101–1102 and one English-language course with the RUSS subject code (3 credit hours; see the list of qualifying courses below). The remaining 6 credit hours may be earned either from Russian- and English-language courses with the RUSS subject code (see the list of qualifying courses below) or from other relevant courses that will be approved by the director of undergraduate studies on a case-by-case basis. A maximum of 6 credit hours toward the Russian minor may be earned from courses taken from other U.S. institutions or through study abroad programs. AP and IB exam credit will not count toward credit hours required for the minor, but placement exams will be offered for RUSS 1101 and/or 1102.

*English-language courses with the RUSS subject code that qualify for the 3 credit hour requirement of the concentration and minor in Russian:* RUSS 1111, 1874, 1910W, 1911W, 2230, 2273, 2434, 2435, 2438, 2485, 2537, 2639 and 2745.

Russian- and English-language courses with the RUSS subject code that qualify for the remaining credit hours required for the concentration and minor in Russian: RUSS 1001, 1111, 1874, 1910W, 1911W, 2201–2202 [only in the case of the minor], 2210, 2230, 2273, 2434, 2435, 2438, 2485, 2537, 2639, 2745, 3303, 3305, 3850–3851, 3880–3881, and 3890–3891.

### Licensure for Teaching

Candidates for teacher licensure in German at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

### German

Students with some experience in German should consult the department for placement.

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

Course descriptions begin on page 164.

### Russian

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

Course descriptions begin on page 201.

## Hebrew

DIRECTOR OF UNDERGRADUATE STUDIES Adam Meyer  
LECTURER Yifat Crouvi

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

Course descriptions begin on page 166.

## History

CHAIR Joel F. Harrington  
VICE CHAIR Celia Applegate  
DIRECTOR OF UNDERGRADUATE STUDIES Lauren Clay  
DIRECTOR OF GRADUATE STUDIES Catherine Molineux  
PROFESSORS EMERITI Paul K. Conkin, Jimmie L. Franklin, Samuel T. McSeveney, Matthew Ramsey, V. Jacque Voegeli, Donald L. Winters  
PROFESSORS Celia Applegate, Lauren Benton, Michael D. Bess, David Blackburn, Richard J. M. Blackett, William Caferro, Jefferson Cowie, Katherine B. Crawford, Dennis C. Dickerson, Marshall C. Eakin, James A. Epstein, Gerald Figal, Joel F. Harrington, Yoshi Igarashi, Peter Lake, Jane Gilmer Landers, Thomas McGinn, Moses Ochon, Thomas Alan Schwartz, Helmut Walser Smith, Arleen M. Tuchman, Daniel H. Usner Jr., David Wasserstein  
ASSOCIATE PROFESSORS David Lee Carlton, Lauren Clay, Julia Phillips Cohen, Emily Greble, Leor Halevi, Sarah Igo, Paul A. Kramer, Catherine Molineux, Ruth Rogaski, Samira Sheikh, Francis W. Wcislo, Edward Wright-Rios  
ASSISTANT PROFESSORS Ari Bryen, Brandon Byrd, Celso Castilho, Peter Lorge, Ole Molvig, Frank Robinson, Alistair Sponsel, Kimberly Welch  
RESEARCH ASSISTANT PROFESSORS Matthew Growhoski, Amy Gant Tan  
SENIOR LECTURER Yollette T. Jones  
LECTURERS Miriam M. Erickson, Alex Jacobs, Kara Schultz, Angela Sutton

MORE than one hundred courses in the Department of History are available to Vanderbilt undergraduates. Some focus on a particular historical period, others on a particular region of the world, and still others on topics that may cross traditional chronological and geographical boundaries. The department is committed to the principle that in a changing world, the way we learn about the past must also change. It will continue to develop new courses for the twenty-first century, with an emphasis on those that recognize the interconnections among the various civilizations and regions of the globe.

Unless indicated otherwise in the course description, history courses have no prerequisite. Except for History 3980, 4960, 4980–4981, and 4999, courses numbered below 5000 are open to all majors and nonmajors. History 4960 is limited to seniors and juniors who have previously taken History 3000W. History 3980, 4980–4981, and 4999 are limited to students who have been admitted to the History Honors Program.

Students will find that the study of history offers not only a strong foundation for a liberal education but also a means of understanding the contemporary world. The skills developed in gathering, assessing, and synthesizing information have wide application in many careers, including business and the professions.

The Department of History offers a major and minor in history and, in cooperation with the Department of Economics, a joint major in economics and history, which is described in this catalog under Economics and History.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in History

The major program requires a minimum of 30 credit hours in history; no more than 3 credit hours of AP or IB credit may count toward this total. *Note:* AP and IB credit will not count toward the 15 credit hours for the concentration.

Course work is distributed as follows:

1. 3000W or 3980 (3 credit hours)

*Note:* 3000W should be taken as soon as possible and must be taken no later than the second semester of the junior year. 3000W is a prerequisite for the 4960 capstone course. 3980 is limited to second-semester juniors who have been admitted to the Honors Program. Students entering the Honors Program who have already taken 3000W will receive elective credit for that course.

2. Five courses in one of the following concentrations (15 credit hours):

- A. Asia
- B. Latin America
- C. Europe
- D. Early America and the United States
- E. Middle East and Africa
- F. Global and Transnational
- G. Science, Medicine, and Technology
- H. Comparative History/Special Topics

See below for a list of courses that count for Concentrations A, B, C, D, E, F, and G. Students choosing concentration H must have the approval of their adviser and the director of undergraduate studies for a specific program of study. First-Year Writing Seminars (1111) in history may be used to satisfy the relevant program concentration with approval of the director of undergraduate studies.

*Program A. Asia*

1050, 1060, 1070, 1080, 1085W, 1090, 1160, 1200, 1881, 2100, 2105, 2110, 2115, 2119, 2120, 2140, 2145, 2150, 2160, 2180, 3090, 3110, 3190, 3220, 3230, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, 4999; ASIA 2511, 2630; MHS 2310.

*Program B. Latin America*

1370, 1380, 1383, 1385W, 1650, 2450, 2457, 2470, 2480, 2490, 2510, 2530, 2535, 2540, 2570, 3100, 3230, 3280, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; AADS 4256.

*Program C. Europe*

1200, 1350, 1355W, 1360, 1470, 1480, 1500, 1510, 1510L, 1520, 1580, 1582W, 1600, 1695W, 1700, 1760, 2130, 2135, 2140, 2160, 2170, 2190, 2220, 2230, 2250, 2260, 2270, 2280, 2290, 2300, 2310, 2340, 2380, 2382, 2383, 2385, 2410, 2450, 2595W, 2660, 2720, 2800, 2835, 2840, 3010, 3050, 3070W, 3100, 3110, 3120, 3150, 3180, 3190, 3210, 3230, 3240, 3260, 3270, 3275, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; Classical Studies 2100, 2110, 2120, 2150, 2160, 2180; Economics, 3160; EUS 2201, 2208, 2220; German 2442; Jewish Studies 1111.09, 1220, 1240, 2450, 2540, 3100, 3210; Philosophy 2100, Religious Studies 3316.

*Program D. Early America and the United States*

1200, 1383, 1385W, 1390, 1395, 1400, 1410, 1420, 1422W, 1438, 1440, 1480, 1500, 1520, 1640, 1650, 1660, 1665, 1690, 1691, 1693, 1725W, 1730, 1740, 1770, 1780W, 2119, 2530, 2535, 2580, 2590, 2595W, 2600, 2610, 2620, 2630, 2640, 2655, 2660, 2685, 2690, 2700, 2710, 2720, 2721, 2722, 2725, 2730, 2735, 2740, 2750, 2780, 2800, 2810, 2840, 3010, 3030, 3040, 3045W, 3050, 3070W, 3100, 3110, 3140, 3170, 3190, 3230, 3240, , and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; AADS 2214; Divinity 6730, 6740; Economics 2150, 3150; HOD 1115; Jewish Studies 1240, 2540, 2560; Medicine, Health, and Society 2110.

*Program E. Middle East and Africa*

1190, 1200, 1270, 1280, 1725W, 2137, 2138, 2140, 2155, 2160, 2170, 2180, 2190, 2660, 3150, 3190, 3200, 3210, 3230, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 4960, 4980–4981, and 4999; AADS 2106; Classical Studies 2180, 3010; Jewish Studies 1111.09, 1200, 1220, 1240, 2540, 2600, 2620, 3210.

*Program F. Global and Transnational*

1190, 1200, 1280, 1370, 1380, 1383, 1385W, 1470, 1600, 1650, 1665, 1691, 1692, 1695W, 1700, 1740, 1881, 2110, 2130, 2135, 2137, 2138, 2140, 2150, 2160, 2170, 2180, 2190, 2450, 2457, 2480, 2490, 2530, 2535, 2540, 2570, 2595W, 2660, 2700, 2710, 2721, 2722, 2725, 2735, 2740, 2835, 2840, 3010, 3100, 3110, 3120, 3150, 3190, 3220, 3230, 3240, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; Classics 2120, 2180, 3010; Jewish Studies 1200, 1220, 1240, 2450, 2540, 3000, 3100; EUS 2220; Medicine, Health, and Society 2110; Religious Studies 3306.

*Program G. Science, Medicine, and Technology*

Students may meet the requirement by taking five courses from the SMT list, among which not more than two may be courses outside the Department of History.

1385W, 1470, 1480, 1500, 1510, 1510L, 1520, 1780W, 2160, 2780, 2800, 2810, 3040, 3045W, 3050, 3070W, 3110, 3230, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; Anthropology 4373; Asian Studies 2630; Astronomy 2130; English 3720 or 3720W; Mathematics 3000; Medicine, Health, and Society 2110, 2310, 2320, 2430; and other courses, as appropriate, with approval of the director of undergraduate studies.

3. Capstone course (3–6 credit hours)

One of the following, to be taken in the junior or senior year; all of the options will require the student to write a major paper. Any capstone course within the student's area of concentration will count toward the five-course requirement for that concentration.

*Option 1: 3883, Internship Research (3 credit hours).* Must be taken in conjunction with 3880 (internship training). Prerequisite: 3000W. *Note:* a student may take 3883 as an elective before completing 3000W but in this case 3883 will not count as a capstone course.

*Option 2: 4960, Majors Seminar (3 credit hours).* Prerequisite: 3000W.

*Option 3: 4980–4981, Senior Honors Seminar (6 credit hours).* Limited to seniors in the History Honors Program. *Note:* At the discretion of the director of honors and the director of undergraduate studies, a student who has taken 4980 but does not take 4981 may be considered to have fulfilled the capstone requirement for the major.

4. Electives (6–12 credit hours, depending on the nature of the capstone course)

*Honors Program*

The Honors Program in History is a three-semester program of study. It offers superior undergraduate history majors a program of advanced reading, research, and writing. The Honors Program combines seminar work and independent study under the supervision of a thesis adviser. This structure provides participants an introduction to historical research and writing, as well as the opportunity to study defined areas of history and significant historical problems that accord with their own interests. The final objectives of the Honors Program

are successful authorship of the honors thesis and graduation with honors or highest honors in the major.

Students apply to the Honors Program in the first semester of the junior year. Students meeting college and departmental requirements will enroll for a total of 12 credit hours: History 3980, Junior Honors Seminar in History (3 credit hours); History 4980–4981 Senior Honors Research Seminar (6 credit hours); and 4999, Senior Honors Thesis (3 credit hours). In addition, the Honors Program requires an oral defense of the honors thesis before a faculty committee at the end of the third semester.

### *Program of Concentration in Economics and History*

This is an interdisciplinary program split between Economics and History that provides a more focused program of study while requiring fewer credit hours than a double major in the two fields. See the Economics and History section of this catalog for details.

### *Minor in History*

The minor in history requires a minimum of 18 credit hours of course work in one area of concentration. No more than 3 credit hours of AP or IB credit may count toward this total. The following options are offered:

#### **I. Asian History**

Six of the courses listed under “Program A. Asia”

#### **II. Latin American History**

1. 1370 or 1380 and
2. Any five of the courses listed under “Program B. Latin America”

#### **III. European History**

1. 1350 or 1360 and
2. Five of the courses listed under “Program C. Europe”

#### **IV. Early America and United States History**

1. 1390, 1400, 1410, or 1420 and
2. Five of the courses listed under “Program D. Early America and the United States”

#### **V. Middle East and Africa**

1. Six of the courses listed under “Program E. Middle East and Africa”

#### **VI. Global and Transnational**

1. Six of the courses listed under “Program F. Global and Transnational”

#### **VII. Science, Medicine, and Technology**

1. Six of the courses listed under “Program G. Science, Medicine, and Technology,” among which no more than two may be courses outside the Department of History.

Course descriptions begin on page 167.

## *History of Art*

CHAIR Kevin D. Murphy  
 DIRECTOR OF UNDERGRADUATE STUDIES Sheri Shaneyfelt  
 PROFESSORS EMERITI Robert A. Baldwin, F. Hamilton Hazlehurst,  
 Milan Mihal, Robert L. Mode, Ljubica D. Popovich  
 PROFESSORS Leonard Folgarait, Vivien Green Fryd, Christopher M. S.  
 Johns, Kevin D. Murphy  
 ASSOCIATE PROFESSORS Tracy Miller, Elizabeth J. Moodey, Betsey A.  
 Robinson, Barbara Tsakirgis  
 ASSISTANT PROFESSORS Mireille M. Lee, Rebecca K. VanDiver  
 MELLON ASSISTANT PROFESSOR Riyaz Latif  
 PRINCIPAL SENIOR LECTURER Sheri Shaneyfelt

THE Department of History of Art treats critically the major fields in world art, from ancient through modern, and serves to connect the arts to the other humanities. Many students will use the program in history of art as a foundation for careers in which analytical reading and writing skills gained in the major are especially valued: as the basis for advanced training in professional schools (such as architecture, law, medicine, journalism, and business), for postgraduate work in history of art, and for employment in galleries, museums, or design-related fields. A major goal of the department is to help students become readers of visual images and material culture throughout their lives, as well as to encourage visual approaches to learning.

Majors in history of art participate in the activities of the Vanderbilt History of Art Society and work closely with departmental advisers. The society sponsors events such as panels, lectures, debates, and other programs where majors meet and engage in discussions with historians of art and museum curators.

The department curriculum complements those of related departments and programs, including African American and Diaspora Studies, American Studies, Asian Studies, Cinema and Media Arts, Classical Studies, European Studies, Latin American Studies, Religious Studies, and Women’s and Gender Studies.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration*

The history of art major requires 30 credit hours and gives students the opportunity to study art and visual culture across a wide range of historical periods, from ancient to contemporary. The program is designed to allow for concentration in particular periods and areas of interest. By requiring courses in both the lecture and seminar format, the program aims to provide a basis of comprehensive knowledge and challenging opportunities for more specialized instruction.

Students should consider related offerings in cognate disciplines in the humanities and social sciences. Those planning graduate work in history of art should pursue advanced studies—which may include honors—and take advanced courses in other departments offering complementary course work. Advanced language studies are strongly recommended, as graduate programs expect reading facility in one language for the M.A. and two for the Ph.D., with French and German the most commonly required. Non-European languages should be considered for those primarily interested in non-Western traditions.

### Requirements for the Program of Concentration

A 1000-level course (3 credit hours): Students must complete one 1000-level survey course in history of art or architecture selected from HART 1100, 1105, 1120 or 1121, 1200, 1205, 1220, 1300, or 1400. This course is not a prerequisite for further history of art course work but must be taken at Vanderbilt; AP and transfer credit will not be accepted.

Area requirements (15 credit hours)—five history of art courses at the 2000 level or above, one each from the following areas:

- a. *Ancient*: HART 2210, 2220, 2260, 3224, 3226, 3228W, 3240W, 3252, 3272; CLAS 2200, 2210, 2250, 3200, 3210
- b. *Medieval*: HART 2270, 2275, 2285, 2288, 2290, 3274
- c. *Renaissance/Baroque*: HART 2310, 2320W, 2325, 2330, 2362, 2390, 3320, 3320W, 3332, 3334, 3334W, 3364W
- d. *Modern*: HART 2600, 2620, 2622, 2625, 2650, 2660, 2710, 2720, 2722, 2750, 2760, 2765, 3718W, 3740, 3767W
- e. *Non-Western*: HART 2110, 2130, 2150, 2175, 2180, 3112, 3140, 3164W

Electives (6 credit hours)—two upper-level courses in history of art (HART 2110 to 3850 and 3890) in addition to the area requirements.

Advanced Seminars (6 credit hours)—HART 4960

### Honors Program

The Honors Program in History of Art allows exceptional undergraduate students to undertake independent research on a topic in art history in consultation with faculty members. The program is open to all history of art majors with junior standing who meet a 3.30 grade point average in all university courses and a 3.30 grade point average in history of art courses. They must also be approved for acceptance into the honors program by the department faculty. Completion of the program requires 9 credit hours of study: HART 3850, Independent Research (the second semester of the junior year, unless studying abroad, in which case one is expected to enroll in this class the first semester of the junior year); HART 4998, Honors Research (first semester of the senior year); and HART 4999, Honors Thesis (second semester of the senior year); submission of an honors thesis; and successful completion of an oral honors examination. These independent research-credit hours are expected to be in addition to the 30 credit hours required for the major in history of art. Students meeting these requirements receive honors or highest honors in history of art, depending on the quality of the thesis, grades in history of art courses, and examination results. Successful departmental honors students will receive a Vanderbilt diploma that records honors or highest honors in history of art.

### Minor in History of Art

The minor in history of art requires 18 credit hours of course work, including the following:

Two 1000-level courses from 1100, 1105, 1120 or 1121, 1200, 1205, 1220, 1300, or 1400, plus any four upper-level history of art courses (HART 2110 to 3850 and 3890, 4960), and classes designated CLAS 2200, 2210, 2250, 3200, 3210, 3720.

### Minor in History of Architecture

The minor in history of architecture requires 18 credit hours of course work, including the following:

Two 1000-level courses from 1100, 1105, 1120 or 1121, 1200, 1205, 1220, 1300, or 1400, plus four upper-level history of art courses selected from HART 2110, 2130, 2150, 2175, 2180, 2210, 2220, 2270, 2275, 2285, 2290, 2650, 2720, 2722, 2780, 2782, 3112, 3140, 3240W, 3252, and CLAS 2200, 2210, 2250, 3200, 3210, 3720.

Course descriptions begin on page 173.

## Honors

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

COURSES designated “Honors” are parts of a special honors program in liberal education. They may be taken only by students who have been appointed College Scholars by the dean of the College of Arts and Science. Some College Scholars are appointed before they arrive for their first semester in residence; others may be appointed on the basis of their records in that first semester. All first-year students in the College of Arts and Science may apply to the associate dean for honors programs for admission to the College Scholars program; only first-year students are considered for admission.

Honors seminars offered in the College Scholars program provide an especially interesting and challenging way for College Scholars to complete certain parts of the program for Achieving Excellence in Liberal Education (AXLE). They are designed to cover topics through the intensive analysis afforded by the seminar setting and format. An honors seminar will satisfy the requirement for a first-year writing seminar. Honors 1810W, 1820W, 1830W, 1840W, 1850W, and 1860W count toward the AXLE requirements identified by the seminars’ titles. Honors 1810W challenges students to examine their personal understanding of life and how their individual experiences overlap with those of the rest of human kind. Honors 1820W gives significant attention to individual and cultural diversity, multi-cultural interactions, sexual orientation, gender, racial, ethical, religious, and “Science and Society” issues. Honors 1830W studies human behavior at the levels of individuals, their interactions with others, their societal structures, and their social institutions. Honors 1840W provides students with a basis for understanding the American experience and the shaping of American values and viewpoints within the context of an increasingly global society. Honors 1850W emphasizes quantitative reasoning and prepares students to describe, manipulate, and evaluate complex or abstract ideas or arguments with precision. Honors 1860W provides a basis for understanding the diversity of experiences and values in our contemporary, global society.

In addition to regular credit hours and grade points, honors seminars carry honors points toward graduation with the designation “Honors in the College of Arts and Science.” College Scholars must earn fifteen honors points to receive that designation (they are not required to earn this designation but may take as many honors seminars as they wish). They may earn up to



thirteen of the required fifteen points in honors seminars: three points each for the first time they take Honors 1810W, 1820W, 1830W, 1840W, 1850W, or 1860W; one point if they take a second seminar in the same area. Single honors points may be earned (a) in departmental honors sections of regular courses, (b) in independent study approved by the associate dean for honors programs, and (c) in a regular course in which an enriched curriculum approved by the Committee on the Honors Program is pursued. Honors points are only earned for courses in which the student earns the grade *B* or better.

Course descriptions begin on page 176.

## Interdisciplinary Studies

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Any student who is at least a sophomore and in good academic standing may earn one credit hour per semester or summer for an internship completed under the designation INDS 3880/3884(summer) exclusively on a Pass/Fail basis. This course may be repeated twice for a maximum of three credit hours. Students are responsible for obtaining their own internship and faculty adviser. The student and faculty adviser work together to plan the academic project associated with the internship. Their agreement must be approved by Associate Dean Yollette Jones.

Course descriptions begin on page 177.

## Jewish Studies

DIRECTOR Allison Schachter  
ASSOCIATE DIRECTOR Adam Meyer  
PROFESSORS Robert F. Barsky, Lenn Goodman, Amy-Jill Levine,  
David J. Wasserstein  
ASSOCIATE PROFESSORS Phillip Ackerman-Lieberman, Julia Phillips  
Cohen, Nathalie Debrauwere-Miller, Idit Dobbs-Weinstein, Jay Geller,  
Ari Joskowitz, Shaul Kelner, Adam Meyer, Allison Schachter  
ASSISTANT PROFESSOR Nina Warnke  
SENIOR LECTURER Judith Klass  
LECTURER Yifat Crouvi

JEWISH Studies at Vanderbilt offers an interdisciplinary academic program that facilitates the critical study of Jewish history, religion, language, philosophy, politics, culture, society, music, art, and literature across continents and over three millennia. Integral to understanding crucial moments in the formation of Christianity and Islam as well as distinct episodes in the cultures of the modern Middle East, Europe, and America, the program accesses the resources of the entire university to explore Judaism, its evolution and expression from biblical times to the present. This interdisciplinary program reflects Vanderbilt's commitment to advancing the understanding of diverse cultures and traditions. Students of all backgrounds will find in Jewish Studies at Vanderbilt

a wide array of material and methodologies, presented by scholars from history, anthropology, sociology, religious studies, philosophy, literature, and history of art. Students may focus on several areas of concentration and tailor the major to their academic and career interests. They also have access to courses offered by the schools of divinity, education, and music; they have access to the Zimmerman Judaica collection as well as the opportunity to study abroad, pursue internships locally or nationally, and do research in archives overseas. The interdisciplinary nature of Jewish Studies offers excellent preparation for graduate studies and provides an outstanding academic foundation for a variety of rewarding career paths. Visit [as.vanderbilt.edu/jewishstudies](http://as.vanderbilt.edu/jewishstudies) for more details.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Jewish Studies

The major in Jewish studies requires a minimum of 30 credit hours.

- Foundational course, 3 credit hours.* JS 1002 or 1002W, Introduction to Jewish Studies.
- Language, 6 credit hours.* A year of modern Hebrew (Hebrew 2201–2202, Intermediate Hebrew) or biblical Hebrew (REL 5120, Intermediate Hebrew).<sup>\*</sup> Proficiency at the level of intermediate Hebrew can be demonstrated through testing. If this option is exercised, students will take an additional 6 credit hours of electives toward the major.
 

<sup>\*</sup>In place of biblical or modern Hebrew, interested students may substitute one of the following languages of the Jewish people: Rabbinic Hebrew, Aramaic, Yiddish, Ladino, or Judaeo-Arabic. For languages not presently taught at Vanderbilt, proficiency at the intermediate level may be demonstrated through an exam administered by a designated member of the Jewish Studies faculty. If this option is exercised, students will take an additional 6 credit hours of electives toward the major.
- Focus courses, 12 credit hours* selected from three of four subfields of study:
  - Area 1: Biblical Studies
  - Area 2: Antiquity and the Medieval World
  - Area 3: Modern and Contemporary Experience
  - Area 4: Culture, Philosophy, and Literature
- Senior capstone course, 3 credit hours.* JS 4970, Senior Project in Jewish Studies. Senior Project proposal must be approved by the director of undergraduate studies.
- Electives (minimum of 6 credit hours)*—Any of the courses listed below that are not used to fulfill a requirement towards the major may be counted as an elective with the exception of JS 3880, which cannot count toward the major because it must be taken Pass/Fail. In addition to courses drawn from Arts and Science departments and the professional schools, nontraditional course work may also be selected, including archaeology at Tel Megiddo (Israel), service learning, and internships. Study abroad is encouraged and can be fulfilled with CET Jewish Studies in Prague and at the Hebrew University of Jerusalem.

### Honors Program

The Honors Program in Jewish Studies offers superior students a more intensive concentration within their major field. Admission to the program requires:

1. A 3.3 cumulative grade point average.
2. A 3.3 cumulative grade point average in Jewish Studies.
3. Completion of the junior year.

Requirements for graduation with Honors in Jewish Studies are:

1. 6 credit hours in Honors sections (JS 4980–4981), including completion of thesis—these credit hours may count as elective credit toward the major. Honors thesis is to be completed by mid-spring of the senior year.
2. Successful completion of an honors oral examination on the topic of the thesis.

### Minor in Jewish Studies

The minor in Jewish studies provides a basic understanding of Jewish history and culture across continents and the past three millennia. The minor requires a minimum of 18 credit hours.

1. *Foundational course, 3 credit hours.* JS 1002 or 1002W, Introduction to Jewish Studies.
2. *Focus courses, 6 credit hours.* (See major for categories.)
3. *Electives (minimum of 9 credit hours)*

Any of the courses listed below that are not used to fulfill a requirement toward the minor may be counted as an elective. Special Topics courses or First-Year Writing Seminar courses dealing with topics related to Jewish studies may be counted with the approval of the program director.

LANGUAGE: **Jewish Studies:** 4301, Jewish Language and Paleography. **Classics:** 3300, Akkadian. **Hebrew (Modern Hebrew):** 1101–1102, Elementary Hebrew; 2201–2202, Intermediate Hebrew; 2301, Advanced Hebrew Grammar; 2302W, Advanced Hebrew Composition; 3851–3852, Independent Study in Modern Hebrew. **REL (Biblical Hebrew):** 5101–5102, Elementary Biblical Hebrew; 5120, Intermediate Biblical Hebrew.

AREA 1. BIBLICAL STUDIES: **Jewish Studies:** 2100, The New Testament in Its Jewish Contexts. **English:** 3370, The Bible in Literature. **Music Literature:** 2310, The Bible and Music. **Religious Studies:** 1200, Introduction to Judaism; 1208, Themes in the Hebrew Bible; 3225, Sexuality in the Hebrew Bible and the Ancient Near East; 3926, Ancient Goddesses; 4938, Marriage in the Ancient Near East and the Hebrew Bible.

AREA 2. ANTIQUITY AND THE MEDIEVAL WORLD: **Jewish Studies:** 1111.01, In a Pluralistic Age: Jews, Christians, and Muslims in Spain; 1200, Classical Judaism: Jews in Antiquity; 1220, Jews in the Medieval World; 2150, Issues in Rabbinic Literature; 2600, Islam and the Jews; 2620, Jews in Egypt; 2640, Jews and Greeks; 3210, Reading across Boundaries: Jewish and Non-Jewish Texts; 3892, Topics in Ancient and Medieval Jewish History. **Anthropology:** 1101, Introduction to Archaeology; 3202, The Collapse of Civilizations. **Classics:** 2100, History of the Ancient Near East; 2120, Greece and the Near East from Alexander to Theodosius; 2160, History of Roman Empire; 3010, The Ancient Origins of Religious Conflict in the Middle East. **History:** 2160, Medicine in Islam; 2170, Islam and the Crusades; 3210c, Muslims, Christians, and Jews in Medieval Spain. **History of Art:** 2260, The Art of Pagans, Christians, and Jews. **Philosophy:** 2101, Hellenistic and Late Ancient Philosophy; 2102, Medieval Philosophy. **Religious Studies:** HUM1610, The Golden Age of Islam; 4554, The Qur'an and Its Interpreters.

AREA 3. MODERN AND CONTEMPORARY EXPERIENCE: **Jewish Studies:** 1111.03, Radical Jews from Karl Marx to Noam Chomsky; 1111.07, From Einstein to Chomsky: Revolutionary Sciences in Jewish America;

1111.09, Jews and Muslims: A Modern History; 1240, Perspectives in Modern Jewish History; 2220, Israeli Culture Through Film; 2300, Modern Jewish Thought; 2400, American Jewish Life; 2450, The Jewish Diaspora; 2500, Modern Israel; 2540, Power and Diplomacy in the Modern Middle East; 2560, Social Movements in Modern Jewish Life; 3100, The Holocaust; 3830, Contemporary Jewish Issues; 3883, Internship Research; 3894, Topics in Modern Jewish History. **European Studies:** 2208, Conspiracy Theories and Rumors in European and U.S. History. **German:** 1111, Representing the Holocaust. **History:** 1111.18, The Life, Science, and Times of Albert Einstein; 2130, Russia: Old Regime to Revolution; 2135, Russia: The U.S.S.R. and Afterward; 2190, Last Empire of Islam; 2300, Twentieth-Century Germany; 2720, World War II; 3150, Cities of Europe and the Middle East; 3160, Immigration, Race, and Nationality: The American Experience. **Political Science:** 2230, Middle East Politics. **Religious Studies:** 2210W, Constructions of Jewish Identity in the Modern World; 3229, The Holocaust: Its Meanings and Implications; 4939, Religious Autobiography. **Sociology:** 3702, Racial and Ethnic Minorities in the United States.

AREA 4. CULTURE, PHILOSOPHY, AND LITERATURE: **Jewish Studies:** 1111.02, Music and Identity in Jewish Traditions; 1111.04, Civil Rights and Civil Wrongs: Black–Jewish Relations in the 1950s and 1960s; 1111.05, Gender, Sexuality, and Desire in Jewish Literature; 1111.06, Reading across the Boundaries: Arab and Israeli Literature and Culture; 1111.10, Jewish Response to Catastrophe; 2210W, Hebrew Literature in Translation; 2230W, American Southern Jews in Life and Literature; 2240W, Black–Jewish Relations in Post-War American Literature and Culture; 2250W, Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors; 2260, Coming of Age in Jewish Literature and Film; 2260W, Coming of Age in Jewish Literature and Film; 2270, Jewish Storytelling; 2270W, Jewish Storytelling; 2280, Jewish Humor; 2280W, Jewish Humor; 2290W, Imagining the Alien: Jewish Science Fiction; 2320, Freud and Jewish Identity; 2330, Is G–d Guilty? The Problem of Evil in Judaism; 2340, Jewish Philosophy after Auschwitz; 2420W, American Jewish Music; 2520, Zionism: Politics, Religion, and Ethnicity; 3000, Major Themes in Jewish Studies. **English:** 3664, Jewish American Literature. **French:** 4430, The Struggle of Encounter: The Israeli–Palestinian Conflict in Literature. **German:** 2445, Nazi Cinema: The Manipulation of Mass Culture; 3344, Women at the Margins: German–Jewish Women Writers. **History of Art:** 2765, Art since 1945. **Music Literature:** 2150, Music, Identity, and Diversity. **Philosophy:** 2109, Twentieth-Century Continental Philosophy; 3005, Jewish Philosophy; 3006, Islamic Philosophy; 3011, Critical Theory. **Religious Studies:** 2220, Jewish Ethics; 2940, Great Books of Literature and Religion; 3270, Jewish Theories of Religion; 3940, The Nature of Evil. **Russian:** 2434, The Russian Cinema; 3231, Jews in Russian Culture: Survival and Identity. **Sociology:** 3204, Tourism, Culture, and Place; 3222, Sociology of Religion.

Course descriptions begin on page 178.

## Latin American Studies

DIRECTOR Edward F. Fischer  
 EXECUTIVE DIRECTOR Avery Dickins de Girón  
 ASSISTANT DIRECTOR, DIRECTOR OF UNDERGRADUATE STUDIES,  
 AND DIRECTOR OF GRADUATE STUDIES Nicolette Kostiw  
 LATIN AMERICAN BIBLIOGRAPHER Paula Covington

Affiliated Faculty

PROFESSORS Robert Barsky (French and Italian), Richard Blackett (History), John Brock (Medicine), Ellen Clayton (Medicine), Daniel Cornfield (Sociology), Pelayo Correa (Medicine), Arthur A. Demarest (Anthropology), Tom D. Dillehay (Anthropology), Marshall Eakin (History), David J. Ernst (Physics), Edward F. Fischer (Anthropology), Earl E. Fitz (Portuguese), Leonard Folgarait (History of Art), Edward H. Friedman (Spanish), Lesley Gill (Anthropology), Ruth Hill (Spanish), Doug Heimbürger (Medicine), David Hess (Sociology), Cathy L. Jrade

(Spanish), Vera Kutzinski (English), Jane G. Landers (History), William Luis (Spanish), Terry Maroney (Law), Peter Martin (Medicine), José Medina (Philosophy), Beverly Moran (Law), Phillip D. Rasico (Spanish), Fernando Segovia (Divinity), Mitchell A. Seligson (Political Science), Randall Thomas (Law), Benigno Trigo (Spanish), Sten Vermund (Medicine), Bart Victor (Management), Elizabeth Zechmeister (Political Science), Mel Ziegler (Art)

ASSOCIATE PROFESSORS Dominique Béhague (Medicine, Health, and Society), Victoria Burrus (Spanish and Portuguese), Beth A. Conklin (Anthropology), Markus Eberl (Anthropology), Quentin Eichbaum (Medicine), Carol Etherington (Nursing), William R. Fowler Jr. (Anthropology), Guilherme Gualda (Earth and Environmental Sciences), Elizabeth Heitman (Medicine), Jonathan Hiskey (Political Science), John Janusek (Anthropology), John Johns (Music), Christina Karageorgou (Spanish), Lorraine Lopez (English), Noam Lupu (Political Science), Douglas Morgan (Medicine), Ifeoma Nwankwo (English), Emanuelle Oliveira-Monte (Portuguese), Cynthia Paschal (Engineering), Tiffany Patterson (African American and Diaspora Studies), Vesna Pavlovic (Art), Efrén O. Pérez (Political Science), Norbert O. Ross (Anthropology), Mariano Sana (Sociology), Mavis Schorn (Nursing), Jose Sibaja (Blair), Tiffany A. Tung (Anthropology), Steven A. Wernke (Anthropology), Gilman Whiting (African American and Diaspora Studies), Edward Wright-Rios (History), Andrés Zamora (Spanish)

ASSISTANT PROFESSORS Candice Amich (English), Adriana Bialostozky (Medicine), Carwil Bjork-James (Anthropology), José Cárdenas Bunsen (Spanish), Kathryn Carlson (Medicine), Ashley Carse (Education), Celso Castilho (History), Ana Christina da Silva Iddings (Education), Neerav Desai (Medicine), Andrew Dustan (Economics), Federico Gutierrez (Economics), Brian Heuser (Education), Maria Luisa Jorge (Earth and Environmental Sciences), Marzia Milazzo (English), Paul B. Miller (French and Latin American Studies), Cecilia Hyunjung Mo (Political Science), Alicia Monroe (African American and Diaspora Studies), Alistair Newbern (Law), Yolanda Redero (Law), W. Frank Robinson (History), Susan G. Stewart (Astronomy), Sarah Vanhooser Suiter (Education), Thomas Verrier (Music), Zina Yzquierdo (Education), Carol Ziegler (Nursing)

SENIOR LECTURERS Frances Alpren (Spanish), Ana Regina Andrade (Economics), Jose Aznar (Spanish), Joe Bandy (Sociology), Lorraine Catanzaro (Spanish), Rachel Chiguluri (Spanish), Paula Covington (Latin American Studies), Sarah Delassus (Spanish), Avery Dickens de Girón (LAS), Herald Falconi (Spanish), Victoria Gardner (Spanish), Chalene Helmuth (Spanish), Clint Hendrix (Spanish), Benjamin Legg (Portuguese), Alicia Lorenzo (Spanish), Patrick Murphy (Spanish), Michael Newton (Law), Elena Olazagasti-Segovia (Spanish), Amarillis Ortiz (Spanish), David Owens (Management), Carolina Palacios (Spanish), Gina M. Perez (Medicine), Maria Paz Pintane (Spanish), Mareike Sattler (Anthropology), James Schorr (Management), Waldir Sepúlveda (Spanish), Cynthia Wasick (Spanish), Catesby Yant (Anthropology)

DESIGNATED by the U.S. Department of Education as a National Resource Center for Latin America, Vanderbilt's Center for Latin American Studies draws on departmental strengths and faculty expertise from across campus. Integrating teaching, research, and service, the center maintains substantive collaborations with all of Vanderbilt's colleges and schools. The center has special strengths in Maya studies, Brazilian studies, Andean studies, and the Black Atlantic, as well as unique library collections of Colombian. Programs of instruction provided by the center promote greater understanding of the region's history, culture, political economy, and social organization and cultivate the ability to think strategically about global issues.

Faculty and courses come from the Departments of Anthropology, Economics, History, History of Art, Political Science, Sociology, and Spanish and Portuguese as well as from Vanderbilt's education, engineering, law, management, medical, music, and nursing schools. The center fosters a lively research community on campus by sponsoring colloquia, conferences,

films, and a speaker series that brings distinguished scholars, government and business leaders, and social activists to campus.

For undergraduates, the Program in Latin American Studies offers an interdisciplinary undergraduate major and a minor in Latin American studies, as well as a minor in Brazilian studies. The program also offers summer opportunities in Brazil and Guatemala, and facilitates study abroad and service learning opportunities in Latin American countries. An honors program is available.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Latin American Studies

The major in Latin American studies consists of 36 credit hours plus a language requirement.

I. Language requirement	demonstrated proficiency
II. Core courses	6 credit hours
III. Distribution requirements	12 credit hours
IV. Area of concentration	12 credit hours
V. Electives	6 credit hours

*Note:* No course may be counted twice in calculating the 36 credit hours. Upon approval of the Committee on Individual Programs and the student's adviser, (a) as many as 6 credit hours may be counted as part of both the interdisciplinary major and a second major, or (b) normally, no more than three introductory-level courses will be counted toward the interdisciplinary major.

**I. Language Requirement.** A student must acquire advanced knowledge of one Latin American language (Spanish, Portuguese, or an indigenous language) and an intermediate knowledge in another Latin American language. The requirement to acquire advanced knowledge of a Latin American language may be satisfied by completing Spanish 3303, or any course with a higher number taught in Spanish, or any course with a higher number taught in Portuguese. The requirement to acquire intermediate knowledge of another Latin American language may be satisfied by successfully completing Spanish 2203, Portuguese 2203, or K'iche' 1101 (formerly Anthropology 2612 indigenous language) Intro to a Maya Language. Individual standardized testing may also be used to demonstrate knowledge.

#### II. Core Courses (6 credit hours)

LAS 2101, Introduction to Latin America  
LAS 4901, Interdisciplinary Research Methods

**III. Distribution Requirements (12 credit hours).** Two relevant classes in two of the following three areas not chosen as the major area of concentration.

- A) History
- B) Language, Literature, and Art History (Departments of Spanish & Portuguese and History of Art)
- C) Social Sciences (Departments of Anthropology, Economics, Political Science, Sociology).

**IV. Area of Concentration (12 credit hours from one of the following areas; special topics and independent study courses must be approved for sufficient LAS content by major adviser):**

**A. History.**

HISTORY: 1370, Colonial Latin America; 1380, Modern Latin America; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2460, Colonial Mexico; 2470, Modern Mexico; 2480, Central America; 2490, Brazilian Civilization; 2510, Reform and Revolution in Latin America; 2530, African Religions in the Americas; 2535, Latin America and the United States; 2540, Race and Nation in Latin America; 2570, Caribbean History, 1492–1983; 3280, Popular Cultures in Modern Latin America; 3850, Independent Study; 3890, Selected Topics in History.

LATIN AMERICAN STUDIES: 2102, Introduction to Brazil.

**B. Language, Literature, History of Art.**

AFRICAN AMERICAN AND DIASPORA STUDIES: 1706, Capoeira: Afro-Brazilian Race, Culture, and Expression; 2148, Blacks in Latin America and the Caribbean; 3248, Atlantic African Slave Trade.

HISTORY OF ART: 3718W, Twentieth-Century Mexican Art: Painting, Cinema, Literature; 3850, Independent Research; 4960, Advanced Seminar.

K'ICHE': 1101, Elementary K'iche' I; 1102, Elementary K'iche' II; 2201, Intermediate K'iche' I; 2202, Intermediate K'iche' II.

LATIN AMERICAN STUDIES: 2102, Introduction to Brazil; 2301, Music of Protest and Social Change in Latin America.

PORTUGUESE: 1103, Intensive Elementary Portuguese; 2203, Intermediate Portuguese; 3301, Portuguese Composition and Conversation; 3302, Brazilian Pop Culture; 3303, Introduction to Luso-Brazilian Literature; 3850, Independent Study; 3892, Special Topics in Portuguese Language, Literature, or Civilization; 4350, Brazilian Culture through Native Material; 4420, Brazilian Literature through the Nineteenth Century; 4425, Modern Brazilian Literature.

SPANISH: 2203, Intermediate Spanish; 2995, Contemporary Latin American Prose Fiction in English Translation; 3303, Introduction to Spanish and Spanish American Literature; 3320, Introduction to Hispanic Cultural Studies; 3330, Cultural Studies in the Andes; 3340, Advanced Conversation; 3345, Spanish for Business and Economics; 3350, Spanish for the Legal Profession; 3355, Advanced Conversation through Cultural Issues in Film; 3360, Spanish Civilization; 3375, Film and Culture in Latin America; 3830, Spanish for the Medical Profession; 3835, Latino Immigration Experience; 3850, Independent Study; 3891, Special Topics in Hispanic Culture; 3892, Special Topics in Spanish Language and Linguistics; 3893, Special Topics in Hispanic Literature; 4310, Translation and Interpretation; 4325, Dialectology; 4340, History of the Spanish Language; 4400, The Origins of Spanish Literature; 4405, Literature of the Spanish Golden Age; 4415, Spanish Literature from 1900 to the Present; 4420, Spanish American Literature from the Conquest to 1900; 4425, Spanish American Literature from 1900 to the Present; 4440, Development of the Short Story; 4445, Development of the Novel; 4450, The Contemporary Novel; 4455, Development of Drama; 4465, The Theory and Practice of Drama; 4470, Development of Lyric Poetry; 4620, Love and Honor in Medieval and Golden Age Literature; 4640, *Don Quixote*; 4720, Literary Genres and National Identities in Latin America; 4730, Modern Latin American Poetry; 4750, Afro-Hispanic Literature; 4755, Latina and Latin American Women Writers; 4760, Literature and Medicine; 4810, Images of the City.

**C. Social and Natural Sciences.**

ANTHROPOLOGY: 2105, Race in the Americas; 2106, Culture and Power in Latin America; 2108, Indigenous Peoples of Lowland South America; 2231, Ancient Andean Civilizations; 2603, Comparative Writing Systems; 3122, The Anthropology of Globalization; 3130, Andean Culture and Society; 3133, Political Anthropology; 3134, Human Rights of Indigenous Peoples; 3140, Myth, Ritual, Belief: The Anthropology of Religion; 3141, Anthropology of Healing; 3143, Medical Anthropology; 3161, Colonial Encounters in the Americas; 3200, Ancient Cities; 3202, The Collapse of Civilizations; 3240, Ancient Mesoamerican Civilizations; 3241, The Aztecs; 3242, The Archaeology of the Ancient Maya Civilization; 3243, Classic Maya Religion

and Politics; 3250, The Inca Empire; 3850–3851, Independent Research; 3890, Special Topics.

ECONOMICS: 2220, Latin American Development; 3650, Development Economics; 3851–3852, Independent Study in Economics.

*Note:* Students who successfully complete an Economics course on this list numbered 4520W or higher may also receive Area of Concentration credit for successfully completing either Economics 3010 or 3020.

MEDICINE, HEALTH, AND SOCIETY: 3210, Health, Development, and Culture in Guatemala; 3212, Health, Development, and Culture in Guatemala.

POLITICAL SCIENCE: 2213, Democratization and Political Development; 2219, Politics of Mexico; 2225, International Political Economy; 3217, Latin American Politics; 3228, International Politics of Latin America; 3897, Selected Topics; 3851–3852, Independent Research.

SOCIOLOGY: 3232, Contemporary Mexican Society; 3322, Immigration in America; 3851, Independent Research and Writing.

V. Electives (6 credit hours). Any two classes listed above (or others approved by the major adviser).

*Honors Program*

An honors program is available, acceptance into which must be approved by the director of undergraduate studies. Students must have a minimum 3.3 cumulative GPA and a 3.3 GPA in courses that count toward the Latin American studies major to be accepted into the program. The Honors Program requires: completion of 6 credit hours in LAS 3851 and 3852; the writing of an honors thesis; and passing an oral honors examination. Interested students should consult their academic adviser during their junior year.

HONORS: 1860W, Honors Seminar: International

*Minor in Latin American Studies*

Students must complete 15 credit hours of approved courses with Latin American content including Latin American Studies 2101. In addition, students must demonstrate intermediate knowledge of one Latin American language by successfully completing Spanish 2203, Portuguese 2203, or Anthropology 2612 (indigenous language). Courses taken to satisfy the language requirement may not be counted toward the 15 credit hours of core courses. Individual standardized testing may also be used to demonstrate knowledge.

Course selection must be approved by the undergraduate adviser of the Program in Latin American Studies.

*Minor in Brazilian Studies*

The Program in Latin American Studies also offers a minor in Brazilian studies. Students must complete 15 credit hours of approved courses with Brazilian content including LAS 2102 and Portuguese 2203. In addition, students must complete three additional courses from the Areas of Study listed below: one course in Area I, one course in Area II, and one course in Area III. Proficiency at the level of intermediate Portuguese can be demonstrated through testing. If this option is exercised, students must take 3 credit hours of course work approved by the director of undergraduate studies in lieu of the 3 credit hours of PORT 2203.

Course selection must be approved by the director of undergraduate studies for Latin American Studies. Other elective courses, including special topics courses, may be counted toward the minor with the approval of the director of undergraduate studies.

Requirements for completion of the minor include at least 15 credit hours as follows:

1. 3 credit hours of LAS 2102: Introduction to Brazil
2. 3 credit hours of PORT 2203: Intermediate Portuguese (PORT 1103 is a prerequisite)
3. 3 credit hours from Area I: Portuguese Language and Literature
4. 3 credit hours from Area II: Brazilian Society, History, and Cultures
5. 3 credit hours from Area III: Brazil in Regional and Global Context

## Areas of Study

### Area of Study I: Portuguese Language and Literature

PORTUGUESE: 3301, Portuguese Composition and Conversation; 3303, Introduction to Luso-Brazilian Literature; 4420, Brazilian Literature through the Nineteenth Century; 4425, Modern Brazilian Literature.

### Area of Study II: Brazilian Society, History, and Cultures

ANTHROPOLOGY: 2108, Indigenous Peoples of Lowland South America.

HISTORY: 2490, Brazilian Civilization.

PORTUGUESE: 3302, Brazilian Pop Culture; 4350, Brazilian Culture through Native Material; 3891, Special Topics in Portuguese and Brazilian Literature or Civilization in English Translation.

### Area of Study III: Brazil in Regional and Global Context

AFRICAN AMERICAN AND DIASPORA STUDIES: 2148, Blacks in Latin America and the Caribbean; 3248, Atlantic African Slave Trade; 1706, Capoeira: Afro-Brazilian Race, Culture, and Expression.

ANTHROPOLOGY: 2106, Culture and Power in Latin America.

ECONOMICS: 2220, Latin American Development.

HISTORY: 1370, Colonial Latin America; 1380, Modern Latin America; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2510, Reform and Revolution in Latin America; 2540, Race and Nation in Latin America.

POLITICAL SCIENCE: 3217, Latin American Politics; 3228, International Politics of Latin America.

SOCIOLOGY: 3231, Contemporary Latin America.

**Course descriptions begin on page 181.**

# Latino and Latina Studies

DIRECTOR William Luis  
ASSOCIATE DIRECTOR Lorraine López

LATINO and Latina Studies focuses on cultural production and political and socioeconomic experiences of people inculcated with the U.S. experience, self-identifying as Latinos and Latinas and communicating primarily in English and sometimes in Spanish. The LATS major and minor will examine this enduring and dynamic population that crosses and re-crosses borders constructed by geography, linguistics, class, race, and gender. This program of study is designed to accommodate a range of voices and multiple manifestations of Latino and Latina identity

and cultural expression in historical and contemporary contexts to fill in this vital but often overlooked component of our national identity and discourse.

Students pursuing a LATS major or minor are expected to obtain language competence in Spanish before completing the program, though they do not need to meet this requirement when declaring the major or minor. Students may satisfy this requirement by completing SPAN 3303, or any other course with a higher number taught in Spanish.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Program of Concentration in Latino and Latina Studies

The interdisciplinary major in Latino and Latina studies consists of thirty-six (36) credit hours. The specific requirements are as follows:

1. LATS 2201, Introduction to Latino and Latina Studies (3 credit hours)
2. SPAN 3303, Introduction to Spanish and Spanish American Literature (3 credit hours)

SPAN 3303 requires up to 19 prerequisite credit hours of Spanish language instruction through SPAN 3302, depending on departmental placement.

3. ENGL 3658, Latino-American Literature (3 credit hours)
4. LATS 4961, Latino and Latina Studies Seminar, which is usually taken in the senior year (3 credit hours)
5. Eight elective courses (24 credit hours) with at least two courses from Group A (Latino and Latina Culture) and two courses from Group B (Historical Context), that have not already been applied to satisfy above requirements.

## Minor in Latino and Latina Studies

Students pursuing the interdisciplinary minor must complete eighteen (18) credit hours. The specific requirements are as follows:

1. LATS 2201, Introduction to Latino and Latina Studies (3 credit hours)
2. SPAN 3303 or ENGL 3658 (3 credit hours)  
If both courses are taken, only one may be applied as elective credit.
3. LATS 4961, Latino and Latina Studies Seminar (3 credit hours)
4. Three other courses (9 credit hours), with at least one course from Group A (Latino and Latina Culture) and one course from Group B (Historical Context), that have not already been applied to satisfy above requirements.

## Approved List of Courses

### Category A: Latino and Latina Culture

ENGLISH: 3658, Latino-American Literature.

HISTORY: 2725, Race, Power, and Modernity.

HUMAN AND ORGANIZATIONAL DEVELOPMENT: 2510, Health Service Delivery to Diverse Populations.

LATINO AND LATINA STUDIES: 3831, Latino and Latina Business and Entrepreneurship.

SOCIOLOGY: 3702, Racial and Ethnic Minorities in the United States; 3322, Immigration in America.

SPANISH: 3302, Spanish for Oral Communication Through Cultural Topics; 3303, Introduction to Spanish and Spanish American Literature; 3345, Spanish for Business and Economics; 3830, Spanish for the Medical Profession; 4310, Translation and Interpretation; 3835, Latino Immigration Experience; 4750, Afro-Hispanic Literature; 4755, Latina and Latin American Women Writers.

### Category B: Historical Context

AFRICAN AMERICAN AND DIASPORA STUDIES: 3178, Colonialism and After.

ANTHROPOLOGY: 2106, Culture and Power in Latin America; 2220/2220W, Human Landscapes; 3160, Anthropologies and Archaeologies of Community; 3161, Colonial Encounters in the Americas; 3202, The Collapse of Civilizations; 3240, Ancient Mesoamerican Civilizations; 3241, The Aztecs; 3242, The Archaeology of the Ancient Maya Civilization; 3243, Classic Maya Religion and Politics.

ENGLISH: 3674, Caribbean Literature.

HISTORY: 1380, Modern Latin America; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2480, Central America; 2570, Caribbean History, 1492–1983; 2580, American Indian History before 1850; 2590, American Indian History since 1850; 3080, U.S. and Caribbean Encounters.

LATIN AMERICAN STUDIES: 2101, Introduction to Latin America.

MUSIC LITERATURE: 2110, Music in Latin America and the Caribbean.

SPANISH: 3892, Special Topics in Spanish Language and Linguistics; 4450, The Contemporary Novel; 4465, The Theory and Practice of Drama; 4740, Spanish-American Literature of the Boom Era; 4760, Literature and Medicine.

### Category C: Critical Perspectives

AFRICAN AMERICAN AND DIASPORA STUDIES: 1010, Introduction to African American and Diaspora Studies.

PHILOSOPHY: 3617, Philosophy of Language.

POLITICAL SCIENCE: 3217, Latin American Politics; 2219, Politics of Mexico; 3228, International Politics of Latin America; 3264W, Global Feminisms.

SOCIOLOGY: 3314, Environmental Inequality and Justice; 3612, Class, Status, and Power; 3701, Racial Domination, Racial Progress; 3232, Contemporary Mexican Society.

WOMEN'S AND GENDER STUDIES: 1150/1150W, Sex and Gender in Everyday Life; 3201, Women and Gender in Transnational Context.

**Course descriptions begin on page 182.**

## Managerial Studies

DIRECTOR Gary R. Kimball

ASSOCIATE DIRECTOR William W. Damon

PROFESSOR William W. Damon

ADJUNCT PROFESSORS Corey M. Cleek, David H. Furse, Stuart A. Garber, David H. Stacey

ASSOCIATE PROFESSORS OF THE PRACTICE Alice R. Goodyear, Arthur J. Johnsen, Gary R. Kimball, Michael K. Lawson, Patrick R. Leddin, Joseph J. Rando, Brent E. Trentham

ADJUNCT ASSOCIATE PROFESSORS Timothy F. Logan, Janet M. McDonald, Garnett H. Slatton

LECTURERS William E. Easley, Douglas D. Edwards, Gary C. McClure

THE College of Arts and Science offers two minors in the liberal arts tradition to help students understand management functions, corporate strategy, and financial economics. These two minors are administered by the Managerial Studies program. Each of the minors has a distinct focus with basis in economics and accounting. Due to an institutional review of the university's undergraduate course offerings in business, first-year students entering in the fall of 2016 or later may not declare the minors in Managerial Studies.

The program is directed by Professor Gary R. Kimball, 215 Calhoun Hall, (615) 322-4021.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Minor in Managerial Studies: Corporate Strategy

The minor in corporate strategy requires 18 credit hours.

The following courses are required:

FNEC 1600 Financial Accounting

MGRL 1100 Fundamentals of Management

MGRL 3250 Corporate Strategy

Three elective courses to be chosen from:

MGRL 1200 Principles of Marketing

MGRL 3200 Advanced Marketing

MGRL 3209 Creative Advertising

MGRL 3300 Entrepreneurial Challenge

MGRL 2300 Entrepreneurship: The Business Planning Process

FNEC 2600 Managerial Accounting

FNEC 2700 Corporate Finance

FNEC 3705 Financial Management

### Minor in Managerial Studies: Financial Economics

The minor in financial economics requires 18 credit hours.

The following courses are required:

ECON 1500 Economic Statistics

or 1510 Intensive Economic Statistics

FNEC 1600 Financial Accounting

FNEC 2700 Corporate Finance

Three elective courses to be chosen from:

FNEC 2600 Managerial Accounting

FNEC 3700 Investment Analysis

FNEC 3705 Financial Management

ECON 2300 Money and Banking

ECON 3300 Financial Instruments and Markets

Mathematics 2820, Psychology 2100, or Psychology 2110 (Peabody College) may substitute for Economics 1500. Economics majors must complete 15 hours of credit in FNEC courses to complete the financial economics minor.

Minors may be combined with any departmental or interdisciplinary major; however, the minor in managerial studies must include 15 credit hours that are being counted solely toward the minor.

Students electing a second minor in managerial studies must complete at least 12 credit hours counted solely toward the second minor.

## Financial Economics

Course descriptions begin on page 162.

## Managerial Studies

Course descriptions begin on page 182.

# Mathematics

CHAIR Mike Neamtu

VICE CHAIR John Ratcliffe

DIRECTOR OF UNDERGRADUATE STUDIES John Rafter

DIRECTOR OF GRADUATE STUDIES Denis Osin

PROFESSORS EMERITI Richard R. Goldberg, Matthew Gould, Robert L. Hemminger, Ettore F. Infante, Bjarni Jónsson, Richard J. Larsen, Michael D. Plummer, Eric Schechter, Horace E. Williams

PROFESSORS John F. Ahner, Akram Aldroubi, Dietmar Bisch, Emmanuele DiBenedetto, Paul H. Edelman, Mark N. Ellingham, Douglas P. Hardin, C. Bruce Hughes, Vaughan F. R. Jones, Gennadi Kasparov, Ralph N. McKenzie, Michael L. Mihalik, Mike Neamtu, Alexander Olshanskiy, Denis Osin, John G. Ratcliffe, Edward B. Saff, Mark V. Sapiro, Larry L. Schumaker, Gieri Simonett, Constantine Tsinakis, Glenn F. Webb, Daoxing Xia, Dechao Zheng

ASSOCIATE PROFESSORS Jesse Peterson, Alexander Powell, Steven T. Tschantz

ASSISTANT PROFESSORS Scott Atkinson, Marcel Bischoff, Anna Marie Bohmann, Jonathan Campbell, Cheng Chu, Marcelo Disconzi, Spencer Dowdall, José Gil-Férez, Gili Golan, Keaton Hamm, Benjamin Hayes, Giusy Mazzone, Robert McRae, Rares Rasdeaconu, Alexandr Reznikov, Rudy Rodsphon, Andrew Sale, Songling Shan, Ioana Suvaina, Maria van der Walt, Kun Wang, Grace Work, Yixiang Wu

SENIOR LECTURER EMERITA Jo Ann W. Staples

SENIOR LECTURERS Derek Bruff, Linda Hutchison, Pamela Pigg, John Rafter, Lori Rafter, Jakayla Robbins

THE Department of Mathematics offers an undergraduate major with a high degree of flexibility. A solid background in mathematics provides an excellent foundation for any quantitative discipline as well as many professions—many students go on to professional studies in law, medicine, or business.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Program of Concentration in Mathematics

Three tracks are available.

Program I (Standard Track) is intended for most mathematics majors in the College of Arts and Science, Blair School of Music, and Peabody College.

Program II (Applied Track) is intended for students in the School of Engineering who elect a second major in mathematics, but is also available for other students.

Program III (Honors Track) is intended for highly qualified students who either are preparing for graduate studies in mathematics or plan to graduate with departmental honors. Students who complete this program and, in addition, complete a senior thesis will graduate with departmental honors.

Requirements for the three tracks are summarized below.

### Program I (Standard Track).

At least 32 credit hours in mathematics, as follows.

1. A calculus sequence: 1300–1301–2300 or 1300–1301–2500–2501.
2. Linear algebra and differential equations: 2600 or 2500–2501, and 2610.
3. At least 15 additional credit hours from 2800 or above.
4. The remainder of the credit hours must be chosen from 2800 or above.

### Program II (Applied Track).

At least 29 credit hours in mathematics and 6 credit hours outside the department, as follows.

1. A calculus sequence as in Program I.
2. Linear algebra and differential equations—one of the following:
  - (a) one of 2410, 2600, or 2500–2501, and one of 2420 or 2610; or
  - (b) 2400 and either 2600 or 2500–2501.
3. At least 12 additional credit hours from 2800 or above, excluding 3000.
4. The remainder of the credit hours in mathematics must be chosen from 2800 or above.
5. At least 6 credit hours of advanced, mathematically based science or engineering courses approved by the director of undergraduate studies. This requirement is automatically fulfilled by students who complete a physics major or a major in the School of Engineering.

### Program III (Honors Track).

At least 38 credit hours in mathematics, as follows.

1. A calculus sequence as in Program I.
2. Linear algebra and differential equations as in Program I.
3. At least 21 additional credit hours of advanced course work,
  - (a) including four courses taken from the following three categories, at least one from each category:
    - 1) Algebra: 3300, 4300, 4301.
    - 2) Analysis: 3100, 3110, 6100, 6101.
    - 3) Topology and Geometry: 3200, 3230, 4200, 4201, 4220, 6210.
  - (b) The remainder of the 21 credit hours must be chosen from 2800 or above, excluding 4999.
4. The remainder of the credit hours must be chosen from 2800 or above.

Students who complete Program III and, in addition, complete a senior thesis will graduate with departmental honors.

Students planning to teach in secondary school should contact the director of secondary education programs in the Department of Teaching and Learning at Peabody College for course recommendations.

### *Honors Program*

The Honors Program in Mathematics is designed to afford superior students the opportunity to pursue more intensive work within their major field. The program requires:

1. Completion of all the requirements of Program III (Honors Track).
2. A minimum grade point average of 3.6 in mathematics.
3. Completion of a senior thesis in Math 4999 (3 credit hours) in the second semester of the senior year. With approval of the director of undergraduate studies, the thesis may be based on research initiated or completed at another academic institution, such as during an NSF-sponsored REU program.
4. Oral examination on the senior thesis. A committee of at least three faculty members—at least two from the Department of Mathematics, one being the thesis adviser—shall evaluate the thesis and the oral examination. Exceptional achievement on the thesis will earn highest honors.

Interested students may apply to the director of undergraduate studies for admission to the Honors Program in their junior year or the first semester of their senior year. Applicants must meet college requirements for entry to the Honors Program, and must carry a minimum grade point average of 3.6 in mathematics.

The application includes a one- to two-page proposal of the planned thesis and the signature of the faculty member who will be the thesis adviser.

The thesis must be submitted no later than two weeks before the end of classes in the semester of graduation. The oral examination will take place by the last day of classes in the semester of graduation. Highest honors will be awarded for a thesis that contains original high-quality research results in combination with an oral defense at the highest quality level.

Students may sign up for Math 4999 during one semester of their senior year. Math 4999 will not count toward the 21 credit hours requirement in Program III.

Please consult the director of undergraduate studies for details.

### *Minor in Mathematics*

The minor in mathematics requires at least 15 credit hours in mathematics, including:

1. Completion of a calculus sequence: 2300 or 2500–2501.
2. Linear algebra and differential equations: as in the Program II major.
3. At least 6 credit hours not used to satisfy item 2 from 2800 or above.

Completion of a single-variable calculus sequence (1200–1201–2200 or 1300–1301) is a prerequisite for the minor, but does not count toward the credit hours of the minor.

### *Licensure for Teaching*

Candidates for teacher licensure at the secondary level in mathematics should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

### *Calculus*

Several calculus sequences are available:

1100; 1200–1201; 1300–1301–2300.

The courses in these sequences cover similar material, but at different rates, and therefore overlap in content and credit. Students should not switch from one to another without approval of the department. Such switching may result in loss of credit. Students intending to take mathematics classes beyond one year of calculus are advised to enroll in the 1300–1301–2300 sequence.

First-year students with test scores of 5 on the Calculus BC advanced placement examination, thereby earning AP credit for 1300–1301, may choose to enroll in the 2500–2501 sequence. The combination of 2500–2501 is a blend of multivariable calculus and linear algebra, with an emphasis on rigorous proofs.

### *Duplicate Credit Policies*

Deduction of credit caused by duplication proceeds as follows. Students who earned math credit

1. through Advanced Placement/International Baccalaureate in one sequence and complete a course at Vanderbilt from another sequence that duplicates this credit will lose credit from the Advanced Placement/International Baccalaureate earnings.
2. by transfer in one sequence and complete a course at Vanderbilt from another sequence that duplicates this credit will lose credit from the Vanderbilt course.
3. at Vanderbilt in one sequence and complete a course at Vanderbilt from another sequence that duplicates this credit will lose credit from the second Vanderbilt course.

**Course descriptions begin on page 182.**

## *Medicine, Health, and Society*

DIRECTOR Jonathan M. Metzl  
 ACTING DIRECTOR Dominique Behague  
 ASSISTANT DIRECTOR JuLeigh Petty  
 DIRECTOR OF UNDERGRADUATE STUDIES Dominique Béhague  
 DIRECTOR OF GRADUATE STUDIES Jonathan M. Metzl  
 DIRECTOR OF ADVISING Courtney S. Muse  
 DIRECTOR OF EVALUATION JuLeigh Petty  
 DISTINGUISHED PROFESSOR George C. Hill  
 PROFESSORS Jonathan M. Metzl, Hector Myers  
 ASSOCIATE PROFESSORS David Aronoff, Dominique Béhague, Derek Griffith, Martha W. Jones, Cindy Kam, Lijun Song  
 ASSISTANT PROFESSORS Aimi Hamraie, Kenneth MacLeish, Ebony McGee, Tara McKay, Laura Stark  
 SENIOR LECTURERS Odie Lindsey, Gabriel Mendes, Clive Mentzel, Courtney S. Muse, JuLeigh Petty

Affiliated Faculty

PROFESSORS Kathryn Anderson (Economics), Victor Anderson (Christian Ethics), Michael Bess (History), James Blumstein (Health Law and Policy), Frank Boehm (Obstetrics and Gynecology), Peter



Buerhaus (Nursing), Christopher Carpenter (Economics), Vera Chatman (Human and Organizational Development), Larry Churchill (Medicine), Ellen Clayton (Pediatrics and Law), Jay Clayton (English), Bruce Compas (Psychology and Human Development), Katherine Crawford (History), Kate Daniels (English), Richard D'Aquila (Infectious Diseases), Dennis Dickerson (History), Volney Gay (Religious Studies), Lenn Goodman (Philosophy), Douglas Heimburger (Medicine), Joni Hersch (Law and Economics), David Hess (Sociology), Carl Johnson (Biological Sciences), John Lachs (Philosophy), Jane Landers (History), Jana Lauderdale (Nursing), Pat Levitt (Pharmacology), Leah Marcus (English), Terry A. Maroney (Law), Richard McCarty (Psychology), Timothy McNamara (Psychology), Velma McBride Murry (Human and Organizational Development), Linda Norman (Nursing), Sharon Shields (Human and Organizational Development), John Tarpley (Surgery), Benigno Trigo (Spanish), Arleen Tuchman (History), Holly Tucker (French), Sten Vermund (Pediatrics and Global Health), Bart Victor (Organization Studies), Kip Viscusi (Law and Economics), Lynn Walker (Pediatrics and Psychology and Human Development), Kenneth Wallston (Nursing and Psychology), David W. Wright (Chemistry), Laurence Zwiebel (Biological Sciences)

ASSOCIATE PROFESSORS Gregory Barz (Ethnomusicology), Mark Bliton (Medicine), Laura Carpenter (Sociology), André Christie-Mizell (Sociology), Beth Conklin (Anthropology), Elizabeth Heitman (Medicine), Julián F. Hillyer (Biological Sciences), Kathleen Hoover-Dempsey (Psychology and Human Development), Sarah Igo (History), Melanie Luttenbacher (Nursing), Ifeoma Nwankwo (English), Scott Pearson (Surgery), Matthew Ramsey (History), Ruth Rogaski (History), Norbert Ross (Anthropology), Russell Rothman (Medicine), David Schlundt (Psychology), Tiffany Tung (Anthropology), Timothy J. Vogus (Management and Organization Studies)

ASSISTANT PROFESSORS Carolyn Audet (Preventive Medicine), Joseph B. Fanning (Medicine), Rolanda Johnson (Nursing), Chandra Y. Osborn (Medicine), Evelyn Patterson (Sociology), Michele Salisbury (Nursing), Kevin T. Seale (Biomedical Engineering)

SENIOR LECTURERS Lorraine Catanzaro (Spanish), Elisabeth H. Sandberg (Psychology)

LECTURER Kyle Brothers (Pediatrics)

The Program in Medicine, Health, and Society offers an interdisciplinary major (36 credit hours) and minor (18 credit hours) for students interested in studying health-related beliefs and practices in their social and cultural contexts. As part of the requirements of the major, students must declare and complete 12 credit hours in one of the six concentrations in Medicine, Health, and Society: global health; health behaviors and health sciences; health economics and policy; inequality, intersectionality, and health justice; medicine, humanities, and arts; or critical health studies. An honors program is available. MHS draws on a variety of fields in the social sciences and humanities—anthropology, economics, history, literature, philosophy/ethics, psychology, sociology, and religious studies. The major will be of particular interest to students preparing for careers in health-related professions as well as to students interested in examining an important part of human experience from multiple perspectives and developing a critical understanding of contemporary society. Students are encouraged to take advantage of the opportunities offered by the Center for Medicine, Health, and Society. Visit [vanderbilt.edu/mhs](http://vanderbilt.edu/mhs) for more details.

The program is directed by Jonathan M. Metz, Frederick B. Rentschler II Professor of Sociology and Medicine, Health, and Society.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Medicine, Health, and Society

The major requires a minimum of 36 credit hours of course work, distributed as follows:

*Note:* No more than 21 credit hours may be in courses designated MHS. Other than MHS, no more than 12 credit hours may be in the same subject area; A&S Psychology and Peabody Psychology are considered the same subject area for purposes of the major/minor.

1. Core Courses — Students must complete one of the following (3 credit hours):

ANTH 2342, Biology of Inequality  
MHS 1920, Politics of Health  
MHS 1930, Social Dimensions of Health and Illness  
MHS 1940, Racial and Ethnic Health Disparities  
MHS 1950, Theories of the Body  
MHS 2110, American Medicine in the World  
MHS 2230, Masculinity and Men's Health

2. Concentration — Students must complete four courses not used to satisfy the core course requirement or the elective requirements in one of the following six concentrations (12 credit hours). Students must declare one of the following concentrations when they declare the major.

*Note:* Courses must be from at least two subject areas.

A. Global health  
B. Health behaviors and health sciences  
C. Health policies and economics  
D. Inequality, intersectionality, and health justice  
E. Medicine, humanities, and arts  
F. Critical health studies

See below for a list of courses that count for Concentrations A, B, C, D, and E. Students choosing concentration F must propose a set of four courses (12 credit hours) that form a coherent program of study related to critical health studies and receive approval from the director of undergraduate studies.

3. Electives — Seven courses not used to satisfy the core course or concentration requirements chosen from the list of approved courses (21 credit hours).

4. Disciplinary Requirement — At least 3 credit hours from the following courses must be used to satisfy the concentration requirement or electives requirement.

ANTH 3143, Medical Anthropology  
ANTH 3141, Anthropology of Healing  
ECON 2350, Health Care Policy  
ECON 3350, Economics of Health  
HIST 2800, Modern Medicine  
MHS 3050W, Medicine and Literature  
PHIL 1008, 1008W, Introduction to Medical Ethics  
PHIL 3608, Ethics and Medicine  
PSCI 3268, American Health Policy  
PSY 3635, Health Psychology  
SOC 3301, Society and Medicine  
SOC 3304, Race, Gender, and Health  
WGS 2240, Introduction to Women's Health

In order to graduate with a major in MHS, students must take a written exam in the second semester of their senior year. (Students who are away during the second semester of their senior year because they are studying abroad or graduating early should schedule the exam during the first semester.) The exam is not graded and no grade will appear on the student's transcript.

The purpose of the exam is to ascertain the extent to which MHS majors demonstrate knowledge of the MHS curriculum.

### *Honors Program*

The Honors Program in Medicine, Health, and Society offers superior students a more intensive concentration within their major field. Admission to the program requires:

1. A 3.3 cumulative grade point average.
2. A 3.3 cumulative grade point average in courses that count toward the Medicine, Health, and Society major.
3. An application that (a) describes the proposed topic; (b) identifies the faculty member who will serve as the thesis adviser; and (c) includes a letter of recommendation from the proposed thesis adviser.

Completion of the program requires:

1. Two semesters, 3 credit hours each semester of the senior year in MHS 4998/4999.
2. An honors thesis of approximately fifty pages that reveals an interdisciplinary perspective, submitted no later than two weeks before the end of classes in the second semester of the senior year, and approved by a committee of at least two faculty members (one of whom must be affiliated with Medicine, Health, and Society).
3. Successful completion of an oral examination focusing on the topic of the thesis.

### *Minor in Medicine, Health, and Society*

The minor consists of a minimum of 18 credit hours of course work, distributed as follows:

*Note:* No more than 9 credit hours may be in the same subject area; A&S Psychology and Peabody Psychology are considered the same subject area for purposes of the major/minor.

1. Core Courses — Students must complete one of the core courses of the major (3 credit hours).
2. Concentration — Students must complete three courses in one of the following five concentrations (9 credit hours). Students must declare one of the following concentrations when they declare the minor.
  - A. Global health
  - B. Health policies and economies
  - C. Health behaviors and health sciences
  - D. Inequality, intersectionality, and health justice
  - E. Medicine, humanities, and arts
3. Electives — Two additional courses, excluding those with an asterisk, chosen from the list of approved courses. (6 credit hours)
4. Disciplinary Requirement — At least 3 credit hours from the following courses must be used to satisfy the concentration requirement or electives requirement.
  - ANTH 3143, Medical Anthropology
  - ANTH 3141, Anthropology of Healing
  - ECON 2350, Health Care Policy
  - ECON 3350, Economics of Health
  - HIST 2800, Modern Medicine
  - MHS 3050W, Medicine and Literature
  - PHIL 1008, 1008W, Introduction to Medical Ethics

PHIL 3608, Ethics and Medicine  
 PSCI 3268, American Health Policy  
 PSY 3635, Health Psychology  
 SOC 3301, Society and Medicine  
 SOC 3304, Race, Gender, and Health  
 WGS 2240, Introduction to Women's Health

### *Approved Courses*

(Please consult the director of undergraduate studies for approval of "as appropriate" courses in concentration areas.)

#### **CONCENTRATION A: Global Health**

AMERICAN STUDIES: 3200, Global Perspectives on the U.S.

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3143, Medical Anthropology.

ASIAN STUDIES: 2630, Chinese Medicine.

BIOLOGICAL SCIENCES: 1111, First-Year Writing Seminar (as appropriate); 3965, Undergraduate Seminar (as appropriate).

FRENCH: 3112, Medical French in Intercultural Contexts.

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 2160, Medicine in Islam.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3200, Global Dimensions of Community Development; 3231, Introduction to Health Services.

INTERDISCIPLINARY STUDIES: 3831, Global Citizenship and Service; 3832, Global Community Service; 3833, Seminar in Global Citizenship and Service (as appropriate).

MEDICINE, HEALTH, AND SOCIETY: 2110, American Medicine and the World; 2310, Chinese Society and Medicine; 2410, HIV/AIDS in the Global Community; 2420, Economic Demography and Global Health; 2510, Caring for Vulnerable Populations; 3000, Undergraduate Seminar (as appropriate); 3010, Perspectives on Global Public Health; 3110, Global Health and Social Justice; 3210, Health, Development, and Culture in Guatemala; 3212, Health, Development, and Culture in Guatemala; 3890, Special Topics (as appropriate); 4010, Psychiatry, Culture, and Globalization.

POLITICAL SCIENCE: 1111, First-Year Writing Seminar (as appropriate); 2215, Change in Developing Countries; 2236, The Politics of Global Inequality; 3893, Selected Topics in American Government (as appropriate); 3894, Selected Topics in Comparative Politics (as appropriate).

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3314, Environmental Inequality and Justice; 3321, Population and Society.

SPANISH: 3830, Spanish for the Medical Profession; 4760, Literature and Medicine.

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2267, Seminar on Gender and Violence; 3201, Women and Gender in Transnational Context.

#### **CONCENTRATION B: Health Policies and Economies**

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2109, Food Politics in America.

ECONOMICS: 1010, Principles of Macroeconomics; 1020, Principles of Microeconomics; 1111, First-Year Writing Seminar (as appropriate); 1500, Economic Statistics; 1510, Intensive Economic Statistics; 2350, Health Care Policy; 3050, Introduction to Econometrics; 3350, Economics of Health.

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 2800, Modern Medicine.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3231, Introduction to Health Services; 3241, Introduction to Health Policy; 3331, Managing Health Care Organizations; 3205, Policy Analysis Methods.

MEDICINE, HEALTH, AND SOCIETY: 1920, Politics of Health; 2120, Health Social Movements; 2250, Autism in Context; 2320, Medicine, Law, and Society; 2420, Economic Demography and Global Health; 3000, Undergraduate Seminar (as appropriate); 3020, U.S. Public Health Ethics and Policy; 3120, Medicine, Technology, and Society; 3220, Healthcare Organizations; 3320, Introduction to US Health Care Policy; 3890, Special Topics (as appropriate).

PHILOSOPHY: 1008, 1008W, Introduction to Medical Ethics; 1111, First-Year Writing Seminar (as appropriate); 3608, Ethics and Medicine.

POLITICAL SCIENCE: 1111, First-Year Writing Seminar (as appropriate); 2236, The Politics of Global Inequality; 2270, Conducting Political Research; 3268, American Health Policy; 3893, Selected Topics in American Government (as appropriate); 3894, Selected Topics in Comparative Politics (as appropriate).

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3302, Poverty, Health, and Politics; 3314, Environmental Inequality and Justice; 4961, Seminars in Selected Topics (as appropriate).

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate).

### CONCENTRATION C: Health Behavior and Health Sciences

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2227, Food in the Ancient World; 3344, Genetic Anthropology Lab Techniques; 4345, Human Evolutionary Genetics.

BIOLOGICAL SCIENCES: 1105, Human Biology; 1111, First-Year Writing Seminar (as appropriate); 3243 Genetics of Disease; 3245, Biology of Cancer; 3254, Neurobiology of Behavior; 3270, Statistical Methods in Biology; 3965, Undergraduate Seminar (as appropriate).

BIOMEDICAL ENGINEERING: 3200, Analysis of Biomedical Data.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3221, Health Service Delivery to Diverse Populations; 3311, Introduction to Health Promotion.

MEDICINE, HEALTH, AND SOCIETY: 1930, Social Dimensions of Health and Illness; 1940, Racial and Ethnic Health Disparities; 2120, Health Social Movements; 2330, Men's Health Research and Policy; 2430, Social Capital and Health; 3000, Undergraduate Seminar (as appropriate); 3030, Community Health Research; 3890, Special Topics (as appropriate).

NEUROSCIENCE: 2201, Neuroscience; 3235, Biological Basis of Mental Disorders.

PSYCHOLOGY: 1111, First-Year Writing Seminar (as appropriate); 1200, General Psychology; 2100, Quantitative Methods; 2150, Principles of Experimental Design; 3100, Abnormal Psychology; 3620, Schizophrenia; 3625, Depression; 3635, Health Psychology; 3705, Human Sexuality; 3750, Perception; 3760, Mind and Brain; 3785, Brain Damage and Cognition; PSY-PC-1250, Developmental Psychology; PSY-PC 2102, Statistical Analysis; PSY-PC 2110, Introduction to Statistical Analysis; PSY-PC-2250, Cognitive Aspects of Human Development; PSY-PC-2300, PSY-PC- Social and Emotional Context of Cognition; PSY-PC-2550, Adolescent Development; PSY-PC-3650, Advanced Topical Seminar (approval dependent upon topic).

SOCIOLOGY: 1010, 1010W, Introduction to Sociology; 1020, 1020W, Contemporary Social Issues; 1111, First-Year Writing Seminar (as appropriate); 2100, Statistics for Social Scientists; 3002, Introduction to Social Research; 3003, Research Practicum; 3301, Society and Medicine; 3303, Social Dynamics of Mental Health; 4961, Seminars in Selected Topics (as appropriate). *\*Only one of SOC 1010 or 1020 may be counted towards the major or minor.*

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2240, Introduction to Women's Health.

### CONCENTRATION D: Inequality, Intersectionality, and Health Justice

AFRICAN AMERICAN AND DIASPORA STUDIES: 1016, Race Matters; 1111, First-Year Writing Seminar (as appropriate); 3214, Black Masculinity: Social Imagery and Public Policy.

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2342, Biology of Inequality; 3343, Biology and Culture of Race; 4345, Human Evolutionary Genetics.

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 3040, Health and the African American Experience.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3221, Health Service Delivery to Diverse Populations.

MEDICINE, HEALTH, AND SOCIETY: 1940, Racial and Ethnic Health Disparities; 2230, Masculinity and Men's Health; 2240, Bionic Bodies, Disability Cultures; 2330, Men's Health Research and Policy; 3000, Undergraduate Seminar (as appropriate); 3040, Designing Healthy Publics; 3140, Afrofuturism and Cultural Criticisms of Medicine; 3890, Special Topics (as appropriate).

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3301, Society and Medicine; 3304, Race, Gender, and Health; 3321, Population and Society; 3723, Gender, Sexuality, and the Body; 4961, Seminars in Selected Topics (as appropriate).

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2268, Gender, Race, Justice, and the Environment.

### CONCENTRATION E: Medicine, Humanities, and Arts

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2370, Death and the Body; 3141, Anthropology of Healing; 3142, Medicine, Culture, and the Body (same as History 2830); 3143, Medical Anthropology.

ASIAN STUDIES: 2630, Chinese Medicine.

ENGLISH: 1111, First-Year Writing Seminar (as appropriate); 3720, 3720W, Literature, Science, and Technology (as appropriate); 3891, Special Topics in Creative Writing (as appropriate).

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 2160, Medicine in Islam; 2800, Modern Medicine; 2810, Women, Health, and Sexuality; 2830, Medicine, Culture, and the Body (same as Anthropology 3142); 2835, Sexuality and Gender in the Western Tradition to 1700; 2840, Sexuality and Gender in the Western Tradition since 1700; 3030, Epidemics in History; 3040, Health and the African American Experience.

MEDICINE, HEALTH, AND SOCIETY: 1111, First-Year Writing Seminar: Medicine, Health, and the Body; 2150, Medical Humanities; 2230, Masculinity and Men's Health; 2250, War and the Body; 2350, Italian Representations of Wellness and Illness; 3000, Undergraduate Seminar (as appropriate); 3050W, Medicine and Literature; 3140, Afrofuturism and Cultural Criticisms of Medicine; 3150, Death and Dying in America; 3250, Perspectives on Trauma; 3350, Medicine, Religion, and Spirituality; 3890, Special Topics (as appropriate); 4010, Psychiatry, Culture, and Globalization; 4050, Narrative and Medicine: Stories of Illness and the Doctor-Patient Relationship.

PHILOSOPHY: 1008, 1008W, Introduction to Medical Ethics; 1111, First-Year Writing Seminar (as appropriate); 3606, 3606W, Moral Problems; 3608, Ethics and Medicine; 3630, Philosophy of Mind.

RELIGIOUS STUDIES: 6711, Post-Freudian Theories and Religion.

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate).

SPANISH: 4760, Literature and Medicine.

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2267, Seminar on Gender and Violence; 2612, Lesbian, Gay, Bisexual, and Transgender Studies.

**OTHER ELECTIVES**

In addition to the electives listed below, any course from the above concentration areas may serve as an elective if it is not already being used to satisfy a concentration requirement. No more than 12 hours of courses with an asterisk in the list below may be used to satisfy the major. Courses with an asterisk may not be used to satisfy the minor. (Please consult the director of undergraduate studies for approval of “as appropriate” courses for electives.)

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 1301, Introduction to Biological Anthropology; 3372, Human Osteology; 4373, Health and Disease in Ancient Populations.

BIOLOGICAL SCIENCES: \*1510–1511, Introduction to Biological Sciences; 2520, Biochemistry.

CHEMISTRY: \*2221–2222, Organic Chemistry; \*2211–2212, Organic Chemistry for Advanced Placement Students.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3342, Introduction to Community Psychology (same as PSY-PC); 3890, Health Promotion Delivery.

MATHEMATICS: 1011, Probability and Statistical Inference; 2810, Probability and Statistics for Engineering; 2820, Introduction to Probability and Mathematical Statistics.

MEDICINE, HEALTH, AND SOCIETY: 1001, Commons Seminar; 3831, Service Learning Research and Readings (*Note:* 3831, Service Learning Research and Readings, must be taken concurrently with 3830); 3850, Independent Study; 3881, Internship Readings and Research (*Note:* 3881, Internship Readings and Research, must be taken concurrently with 3880).

NURSING: \*1601, Introduction to Nutrition; \*1602, Nutrition and Health; \*3101–3102, Anatomy and Physiology.

PHILOSOPHY: 1111, First-Year Writing Seminar (as appropriate); 3606, 3606W, Moral Problems; 3630, Philosophy of Mind.

PSYCHOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3600, Personality; 3610, Introduction to Clinical Psychology OR PSY-PC-3200, Introduction to Clinical Psychology; 3615, Emotion; PSY-PC-1205, PSY-PC-1207, Minds, Brains, Cultures, and Contexts; PSY-PC-2400, Social and Personality Development; PSY-PC-2500, Infancy; PSY-PC-2550, PSY-PC-, Introduction to Community Psychology (same as HOD-3342) PSY-PC-3650, Advanced Topical Seminar (as appropriate).

RELIGIOUS STUDIES: 6711, Post-Freudian Theories and Religion.

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 4961, Seminars in Selected Topics (as appropriate).

**Course descriptions begin on page 185.**

## Nanoscience and Nanotechnology

DIRECTORS Paul E. Laibinis, Sandra J. Rosenthal

FACULTY in the School of Engineering and the College of Arts and Science offer an interdisciplinary minor in nanoscience and nanotechnology. The minor is administered by the School of Engineering in collaboration with the College of Arts and Science.

Nanoscience and nanotechnology are based on the ability to synthesize, organize, characterize, and manipulate matter

systematically at dimensions of ~1 to 100 nm, creating uniquely functional materials that differ in properties from those prepared by traditional approaches. At these length scales, materials can take on new properties that can be exploited in a wide range of applications such as for solar energy conversion, ultra-sensitive sensing, and new types of vaccines. These activities require the integration of expertise from various areas of science and engineering, often relying on methods of synthesis, fabrication, and characterization that are beyond those encountered in an individual course of study.

Students who minor in nanoscience and nanotechnology learn the principles and methods used in this rapidly growing field. Its core originates in the physical sciences by providing key approaches for describing the behavior of matter on the nanoscale. Synthetic approaches are used to manipulate matter systematically, for creating uniquely functional nanomaterials that can be inorganic, organic, biological, or a hybrid of these. With a third component of characterization, a process for designing systems to have particular properties as a result of their composition and nanoscale arrangement emerges. Students are introduced to these areas through foundational and elective courses for the minor that are specified below, the latter of which can be selected to fulfill the degree requirements for their major. The minor in nanoscience and nanotechnology is supported by the Vanderbilt Institute of Nanoscale Science and Engineering (VINSE) that brings together faculty from the College of Arts and Science, the School of Engineering, and the Medical Center. A specialized laboratory facility maintained by VINSE provides students in the minor with capstone experiences that allow them to prepare and characterize a variety of nanostructured systems using in-house state-of-the-art instrumentation. This hands-on laboratory component enhances the attractiveness of students to both employers and graduate schools.

Details of the minor requirements are provided in the School of Engineering section of the catalog.

## Neuroscience

DIRECTOR David H. Zald

DIRECTOR OF UNDERGRADUATE STUDIES Elizabeth Catania

Steering Committee

PROFESSORS Vivien A. Casagrande (Medicine), Renè Marois (Psychology), Douglas G. McMahon (Biological Sciences), Mark Wallace (Medicine)

ASSISTANT PROFESSORS Elizabeth Catania (Neuroscience), Alexander Maier (Psychology)

SENIOR LECTURER Leslie M. Smith (Psychology)

THE study of the nervous system is an interdisciplinary enterprise that draws upon a variety of scientific disciplines ranging from molecular biology and biophysics to computational science and engineering to the study of behavior and cognition. To meet the challenge of providing training for entry into this exciting and growing field, Vanderbilt offers an interdisciplinary program of concentration in neuroscience that utilizes expertise from several departments within the university. The program consists of three components. The first provides for a broad foundation in the basic sciences and mathematics. Second, the program provides for exposure to each of the general areas of neuroscience including courses in cellular/molecular, systems, and integrative/cognitive neuroscience. This course work is

supplemented with exposure to the laboratory techniques utilized in neuroscience research. Finally, the program allows students to pursue more work in the specific sub-disciplines of neuroscience and in areas of inquiry related to neuroscience through elective courses. Students are especially encouraged to participate in research in the laboratories of neuroscience faculty under the auspices of the undergraduate research courses. More extensive research experience is available through the Honors Program in Neuroscience. For additional information, see [as.vanderbilt.edu/neuroscience](http://as.vanderbilt.edu/neuroscience).

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration

Students majoring in neuroscience are required to complete a core of introductory courses in mathematics, chemistry, physics, and biology that provide the broad scientific background necessary to the study of neuroscience. The neuroscience major consists of 39 credit hours of course work that includes 8 credit hours of organic chemistry and 31 credit hours of neuroscience and related courses distributed among specific disciplines associated with the study of neuroscience. The areas and associated course options are listed below. Excluding research credit (3861, 3862, 3863, 3864, and 4999), the neuroscience and related courses must be drawn from at least two departments or programs. Students seeking a second major within the College of Arts and Science may count a maximum of 6 credit hours of 2000-or-higher-level course work to meet the requirements of both majors.

### Required Math and Science Courses

#### Biological Sciences (8 credit hours)

BSCI 1510, 1511, 1510L, and either 1511L or 1512L.

#### Chemistry (8 credit hours)

CHEM 2211 or 2221; CHEM 2212 or 2222; and CHEM 2221L and 2222L.

#### Mathematics, Statistics, Computer Science (6–8 credit hours)

MATH 1100, 1200, or 1300; and one of MATH 1201, 1301, BSCI 3270, PSY 2100, PSY-PC 2110, CS 1101, 1103.

#### Physics (8 credit hours)

PHYS 1501 or 1601; PHYS 1502 or 1602; PHYS 1501L or 1601L; and PHYS 1502L or 1602L.

### Neuroscience Courses

#### Introduction to Neuroscience (3 credit hours)

NSC 2201.

#### Cellular and Molecular Neuroscience (6 credit hours)

BSCI 3252, 3256; NSC 3235, 3240, 3245, 3260, 3269, 3891.

#### Systems, Integrative, and Cognitive Neuroscience (6 credit hours)

BSCI 3230, 3254; NSC 3270, 3274, 3892, 4961, 4969; PSY 3120, 3620, 3700, 3750, 3760, 3765, 3775, 3780, 3785.

#### Neuroscience Laboratory (4 credit hours)

NSC 3861, 3862.

#### Neuroscience Electives (6 credit hours)

Two additional courses from the Cellular and Molecular Neuroscience and/or Systems, Integrative, and

Cognitive Neuroscience courses listed above. NSC 3863 may be used to count for one elective course.

### Related Course Electives

(6 credit hours; two courses not used to satisfy the Required Math and Science course requirement above.)

BSCI 2201, 2201L, 2210, 2210L, 3270, 4265; BME 3100, 3101; CHEM 2100, 3310, 3710, 4720; CS 1101, 1103; MATH 2300, 2400, 2420; PHIL 3616, 3630; PSY 2100, 3100, 3600, 3625, 3705, 3715.

### Honors Program

Superior students with a strong interest in research are encouraged to consider the Honors Program in Neuroscience. Normally a student will apply to enter the Honors Program in the second semester of the junior year and assemble an Honors Committee that will consist of the research mentor and at least two other appropriate members of the faculty. Entrance into and satisfactory completion of the Honors Program requires that students maintain a cumulative grade point average of 3.3 and a grade point average of 3.3 in courses counting toward the neuroscience major. Honors candidates must meet all the normal requirements for the neuroscience major, but are expected to complete at least 8 credit hours of research course work (from NSC 3861, 3862, 3863, 3864, and/or 4999). Three of these research-credit hours may count toward neuroscience elective course work. As part of this research course work, the candidate will be expected to write an honors thesis, present the thesis during the final semester in residence, and satisfactorily pass an oral examination by the student's Honors Committee. Students interested in becoming honors candidates should consult with the director of honors and independent study. For more information on the Honors Program, please see [as.vanderbilt.edu/neuroscience/the-honors-program](http://as.vanderbilt.edu/neuroscience/the-honors-program).

### Minor in Neuroscience

This program provides a foundation of knowledge in neuroscience that is appropriate for students majoring in a related discipline or who have a general interest in the nervous system. As prerequisites, students are required to complete CHEM 1601 and 1601L, BSCI 1510 –1511, 1510L, and either 1511L or 1512L. The minor program consists of 18 credit hours of course work distributed as follows:

NSC 2201.

3 credit hours in Statistics/Computer Science:

BSCI 3270, PSY 2100, PSY-PC 2110, CS 1101 or 1103.

6 credit hours chosen from the courses listed as

“Cellular and Molecular Neuroscience.”

6 credit hours chosen from the courses listed as

“Systems, Integrative and Cognitive Neuroscience.”

The chosen courses counting towards the 18 credit hours must come from at least 3 different departments or programs (e.g. NSC, PSY and BSCI).

Research courses (NSC 3860, 3861, 3862, 3863, 3864, and 4999) do not count towards the minor.

**Course descriptions begin on page 188.**

## Philosophy

CHAIR Robert Talisse  
 DIRECTOR OF UNDERGRADUATE STUDIES Michael P. Hodges  
 DIRECTOR OF GRADUATE STUDIES Julian Wuerth  
 PROFESSORS EMERITI Clement Dore, Robert R. Ehman, Marilyn Friedman, John F. Post, Charles E. Scott, Donald W. Sherburne, Henry A. Teloh  
 PROFESSORS Lenn E. Goodman, Michael P. Hodges, John Lachs, Larry May, José Medina, Kelly Oliver, Lucius T. Outlaw Jr., Robert Talisse, David Wood  
 ASSOCIATE PROFESSORS Idit Dobbs-Weinstein, Lisa Guenther, Jeffrey Tlumak, Julian Wuerth  
 ASSISTANT PROFESSORS Scott Aikin, Karen Ng  
 SENIOR LECTURERS Jonathan Bremer, Gary Jaeger, Martin Rapisarda

THE Department of Philosophy at Vanderbilt offers a wide range of courses relating philosophy to various dimensions of human concern. The department also emphasizes those philosophers and movements that have had significant, forming effect in Western culture.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Philosophy

The program of concentration should be tailored to the needs and interests of the student. The following distribution of courses is required as part of the major. Logic: 1003 or 3003 (at least 3 credit hours); Ethics: 1005, 3605, 3606, or 3606W (at least 3 credit hours); History of Philosophy: 2100, 2102, 2103, or 2104 (at least 6 credit hours). Any alterations must be approved by the director of undergraduate studies. We encourage all majors to work closely with their advisers to select courses that form a coherent whole. The student must take at least 30 credit hours in the major field of which at least 21 credit hours must be in courses beyond the 1000 level.

### Honors Program

The Honors Program offers opportunities for advanced study in philosophy, including independent research projects and/or enrollment in certain graduate seminars (with permission of the instructor). To be admitted to the program, the student must: (a) be a major in philosophy; (b) have a grade point average of 3.3 in all courses; (c) have a 3.5 grade point average in philosophy courses; and (d) develop a written proposal for advanced study in consultation with a philosophy faculty sponsor. Students who satisfy these requirements should meet with the director of undergraduate studies to review their programs, whereupon the director may nominate the students for honors work. Honors work typically begins in the junior year or in the first semester of the senior year; students in the program must complete at least 3 credit hours of Philosophy 3999. Students who successfully complete the program while maintaining the grade point averages of 3.3 generally, and 3.5 in the major, will receive honors in philosophy; students who do especially distinguished work will receive highest honors.

### Minor in Philosophy

The minor in philosophy consists of 18 credit hours, including at least 12 credit hours in courses beyond the 1000 level. The minor program will be constructed so as to provide a broad grounding in philosophy and to complement the student's other studies. Each program must be approved by the director of undergraduate studies.

*Note:* 1002 or 1002W or 1005 or 1111 are ordinarily taken prior to all other philosophy courses, except 1003 and 3003 (logic courses), 3616 (philosophy of science), and 3013 (aesthetics).

**Course descriptions begin on page 189.**

## Physics and Astronomy

CHAIR Robert J. Scherrer  
 DIRECTOR OF UNDERGRADUATE STUDIES David A. Weintraub  
 DIRECTOR OF GRADUATE STUDIES Julia Velkovska  
 PROFESSORS EMERITI Royal G. Albridge, John Paul Barach, Charles A. Brau, Leonard C. Feldman, Dennis Hall, Arnold M. Heiser, P. Galen Lenhart, Volker E. Oberacker, C. E. Roos, Medford S. Webster  
 PROFESSORS Frank E. Carroll Jr., Walter J. Chazin, Charles W. Coffey, Louis DeFelice, David J. Ernst, Daniel M. Fleetwood, John C. Gore, Senta V. Greene, Richard F. Haglund Jr., Joseph H. Hamilton, M. Shane Hutson, Will E. Johns, Thomas W. Kephart, Charles F. Maguire, Sokrates T. Pantelides, James Patton, Ronald R. Price, Akunuri V. Ramayya, Sandra J. Rosenthal, Robert J. Scherrer, Paul D. Sheldon, Keivan G. Stassun, Norman H. Tolk, A. Sait Umar, Julia Velkovska, Thomas J. Weiler, David A. Weintraub, Robert A. Weller, John P. Wikswo Jr.  
 DISTINGUISHED RESEARCH PROFESSOR C. Robert O'Dell  
 ASSOCIATE PROFESSORS Andreas Berlind, Kirill Bolotin, Steven E. Csorna, Kelly Holley-Bockelmann, Hassane Mchaurab, Kalman Varga, Sharon Weiss, Yaqiong Xu  
 ASSISTANT PROFESSORS Dennis Duggan, Daniel F. Gochberg, Alfredo Gurrola, William R. Holmes, Erin Rericha  
 SENIOR LECTURERS Forrest Charnock, Sourish Dutta, Erika Grundstrom, Momchil Velkovsky

AS fundamental sciences, physics and astronomy continue to be driving intellectual forces in expanding our understanding of the universe, in discovering the scientific basis for new technologies, and in applying these technologies to research. In keeping with this crucial role, the Department of Physics and Astronomy offers courses dealing with both the cultural and intellectual aspects of the disciplines, a broadly based major program flexible enough to serve as preparation for graduate study in physics, applied physics, medical physics, astronomy or astrophysics, professional study in another area, or technical employment, and minor programs for students desiring to combine physics or astronomy with other majors. An honors program is available for qualified departmental majors.

A distinguishing feature of the Vanderbilt undergraduate curriculum is the close coupling between teaching and research. At Vanderbilt, active research groups are studying the physics of elementary particles; nuclear structure and heavy-ion reactions; nonlinear interactions of lasers with materials at ultrafast time scales; the behavior of electrons, atoms, molecules, and photons near surfaces; the electric and magnetic properties of living systems; the structure and dynamics of biopolymers; young stars; and cosmology. All professors are engaged in research, and undergraduate students can

participate in this research informally or through independent study or summer work.

The Society of Physics Students arranges informal discussions.

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### Program of Concentration in Physics

The departmental major provides a thorough grounding in the core areas of physics. It is suitable either as a preparation for careers in science and engineering or as a springboard for applying technical knowledge in such fields as business, medicine, law, public policy, and education. The major in the Department of Physics and Astronomy consists of 32 or 33 credit hours, depending on the student's choice for requirement 1.

1. The second semester (Physics 1502 and 1502L or 1602 and 1602L or 1902) in introductory, calculus-based physics;
2. A 19-credit-hour core sequence, which consists of five courses covering the major subdisciplines of physics at an intermediate level and one semester each of the astronomy and physics seminars (Astronomy 2600, Physics 3600); and
3. 9 credit hours of electives in physics or astronomy, with at most 6 of these 9 credit hours earned from any combination of directed study (3840), independent study (3860), and/or Honors research (4998).

The core intermediate-level courses are: Concepts and Applications of Quantum Physics (Physics 2250 or 2250W); Modern Physics (Physics 2260 or 2260W); Thermal and Statistical Physics (Physics 3200 or 3207); Classical Mechanics I (Physics 2270); and Electricity, Magnetism, and Electrodynamics I (Physics 2290). Exceptionally well-qualified students should discuss their first-year program with the director of undergraduate studies for appropriate advising.

The electives required by the major may be satisfied by any combination of courses offered by the department that are at the 2000 level or above, with the exception of the seminar courses Physics 3600 and Astronomy 2600 (one credit hour of each is already required for the major). Other courses may count as an elective, such as courses offered by the engineering school (or other departments and schools) that are particularly relevant, such as a course in health physics, optics, or materials science. Such exceptions must be approved by the department's Undergraduate Program Committee. Other courses, such as 1000-level courses in the physics department or additional credit hours of the Physics seminar (3600) or Astronomy seminar (2600) will be considered with sufficient justification. The purpose of the above policy is to allow relevant courses to count without having to specify them in advance, since it is expected that the relevant courses offered by other departments and schools will change and it is not practical to attempt to maintain a list of approved electives. Majors should seek approval of an elective from their adviser prior to their taking the course and, if applicable, from the department's Undergraduate Program Committee.

Students with specific educational or professional objectives in the sciences or engineering may wish to augment the major by taking additional courses to prepare for graduate study or employment in physics, astronomy and astrophysics, applied physics, or medical physics. Students are encouraged

to consult with the director of undergraduate studies to learn about study abroad options.

### Additional Information on Introductory Course Sequences

The 1501/2 sequence is a calculus-based introduction to physics taught within the context of life science applications. The 1601/2 sequence is a calculus-based introduction to general physics and its applications intended for students in the natural sciences and engineering. Students taking 1501/2 are strongly encouraged to enroll in the laboratory courses (1501L/2L) designed to accompany those lecture courses. Similarly, students taking 1601/2 are strongly encouraged to enroll in the laboratory courses (1601L/2L) designed to accompany those lecture courses. In exceptional circumstances, however, a student may take an unmatched laboratory + lecture (e.g., 1501 + 1601L) and receive AXLE credit for the MNS laboratory science requirement. Students who must mix-and-match the laboratory and lecture courses should consult with their adviser and the director of undergraduate studies for Physics and Astronomy before doing so.

### Licensure for Teaching

Candidates for teacher licensure in physics at the secondary level may qualify by taking the basic physics major together with the requisite education courses described in the chapter on Licensure for Teaching in the Peabody College section of the catalog. See also *Physics Education Course* listing.

### Honors Program

A student majoring in the Department of Physics and Astronomy may apply for admission to an honors program that allows the student to engage in independent study under the guidance of a faculty member, usually in an area related to an ongoing research program in the department. Admission to the Honors Program is granted only to students who have attained a departmental GPA and overall GPA of at least 3.300. The requirements for graduation with honors in physics or in astronomy are: at least a 3.300 average both in the department and overall; at least 10 credit hours in Physics 3860, Physics 4998, Astronomy 3860, Astronomy 4998; a senior thesis of high merit; and high attainment on an oral honors examination given near the end of the senior year.

### Departmental Minors

The physics or astronomy minor is suitable for students who wish to supplement a related discipline or simply have a general interest in the field. Note that the Independent and Directed Study portion of the physics minor is not a requirement but may count toward the minor under certain circumstances. Seek departmental approval before enrolling in either of these classes.

#### Minor in Physics

The minor requires a minimum of 19 credit hours of course work, distributed as follows:

Any first-semester calculus-based physics class with lab (1501 and 1501L, 1601 and 1601L, or 1901)	4-5
Any second-semester calculus-based physics class with lab (1502 and 1502L, 1602 and 1602L, 1902)	4-5
Physics 2250, 2250W, 2260, or 2260W	4

Two 2000-level or higher-level physics courses.

One of these may be a 3 credit hour one-semester directed study course (3840), a 3 credit hour one-semester independent study course (3860), or a 3 credit hour non-PHYS course, the latter if approved by the Undergraduate Program Committee.

Physics 3600 6

1

Total credit hours: 19–21

#### Minor in Astronomy

Astronomy 1110 and 1110L; or 3000 and 1110L; or 1220 4

Four other astronomy courses, one of which may be a 3-credit-hour directed study (ASTR 3840) 12

Two semesters of ASTR 2600 2

Total credit hours: 18

## Physics

Course descriptions begin on page 191.

### Introductory Courses

1001, 1110, 1110L, 1111, 1501, 1501L, 1502, 1502L, 1601, 1601L, 1602, 1602L, 1901, 1902

Introductory, calculus-based physics is offered at several different levels, each with the appropriate laboratory. Only one of 1501/1601/1901 and one of 1502/1602/1902 may be taken for credit. Physics 1501–1502/1501L–1502L is intended for students in the health sciences. Physics 1601–1602/1601L–1602L is intended for students in engineering. Physics 1901–1902 is intended for students planning to major in physics or pursue research-oriented careers in science, engineering, or mathematics; however, students may major in physics after starting in any of these three introductory physics sequences. Prospective majors are strongly advised to begin their study of physics in the fall semester of their freshman year whenever possible, although with careful planning it is possible to complete the physics major with a later start. Physics 1110 is intended for students without strong backgrounds in mathematics or science who have a general interest in the subject. 1110 is not recommended as preparation for further study in a natural science, is not appropriate for engineering, premedical, or pre-dental students, and does not count toward the physics major or minor.

### Intermediate Courses

2210, 2250, 2250W, 2260, 2260W, 2270, 2290, 2237, 2660, 3200, 3207, 3600

The intermediate-level courses cover the major subdisciplines of classical and modern physics.

### Advanced Courses

2271, 2291, 3640, 3651, 3652, 3660, 3840, 3860, 3890, 4998

These courses are intended for physics majors in their junior and senior year and provide material supporting independent study or honors projects in physics.

### Medical and Health Physics Courses

2805, 3125, 3645

### Physics Education Courses

3820

## Astronomy

Course descriptions begin on page 144.

### Introductory Courses

1001, 1110, 1110L, 1120L, 1111, 1220

### Intermediate Courses

2110, 2130, 2220, 2600, 3000

### Advanced Courses

3600, 3700, 3800, 3900, 3840, 3860, 4998

## Political Science

CHAIR David E. Lewis

ASSOCIATE CHAIR Jonathan T. Hiskey

DIRECTOR OF UNDERGRADUATE STUDIES Carrie A. Russell

DIRECTOR OF GRADUATE STUDIES Jonathan T. Hiskey

PROFESSORS EMERITI M. Donald Hancock, Erwin C. Hargrove, William C. Havard Jr., Richard A. Pride, James Lee Ray, Benjamin Walter

VISITING DISTINGUISHED PROFESSORS David Maraniss, Jon Meacham

PROFESSORS Larry M. Bartels, William James Booth, Joshua D. Clinton, John G. Geer, Marc J. Hetherington, Cindy D. Kam, David E. Lewis,

Bruce I. Oppenheimer, Edward Rubin, Mitchell A. Seligson, Carol M. Swain, Alan Wiseman, Elizabeth J. Zechmeister

ASSOCIATE PROFESSORS Brooke A. Ackerly, Brett V. Benson,

Jonathan T. Hiskey, Noam Lupu, Efrén O. Pérez, Tariq Thachil

ASSISTANT PROFESSORS Allison Anoll, Katherine B. Carroll, Amanda Clayton, Suzanne Globetti, Brenton Kenkel, Kristin Michelitch, Cecilia

Mo, Emily Nacol, Sharece Thrower, Keith Weghorst, Hye Young You

SENIOR LECTURER Carrie A. Russell

THE Department of Political Science is oriented toward both teaching and research and has multiple missions. First, it offers a balanced curriculum for undergraduates and graduate students to study the art and science of politics. Second, it offers training for students preparing to become professionals in political science and other fields. Third, it exists as a research faculty seeking new knowledge about government and politics.

Many members of the faculty have national and international reputations in their fields of scholarship. These research and teaching interests vary widely, from political leadership to the comparison of new and old democratic governments, issues of political economy, and ethical questions about politics.

Political science majors may participate in independent study, directed study, selected topics seminars, first-year seminars, the Honors Program, and internships. Average class size is close to thirty—small classes make personal contact with the faculty relatively easy. Students participate in the governance of the department through the Undergraduate Political Science Association, and may qualify for membership in Pi Sigma Alpha, the national political science honorary society.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).



### Program of Concentration in Political Science

Students majoring in political science are required to complete a minimum of 30 credit hours of work, distributed as follows:

Political Science 1110, 1101, 1102, 1103 or 1150	6
Political Theory (2202, 2203, 2205, 2207, 2207W, 2208, 2209, 3253, 4257, 3258, 2262, 3264W, 2270, 3271, 3896)	3
Comparative Politics (2210, 3211, 2213, 2215, 2216, 3217, 2219, 2223, 3228, 2230, 3235, 2236, 4238, 2270, 3272W, 3894)	3
International Politics (3211, 2221, 2222, 2223, 2225, 2226, 3228, 3229, 2236, 2270, 3272W, 2273, 2274, 3275, 4277, 3895)	3
American Government and Politics (2240, 3241, 2243, 3244, 2245, 3247, 3249, 3250, 2251, 3252, 3253, 3254, 2255, 2256, 2259, 3260, 2262, 2265, 2266, 2267, 3268, 2270, 3893)	3
Electives (Any 2000, 3000, or 4000-level course listed above; 3897; one additional 1100-level course, including 1111; up to 6 credit hours of 3882, 3883, 3851, 3852, 3841, 3842, 4998, 4999 combined)	12
Minimum credit hours: 30	

In order to graduate with a political science major, students must take a brief exam within the subfield in which they are most interested during their senior year. Students are to take this exam in the fall of their senior year (students who are on leave or are studying abroad during the fall semester of their senior year should schedule the exam upon their return to campus). The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to ascertain the extent to which political science majors are retaining core aspects of the political science curriculum.

In meeting the above requirements, students must develop a specialty within one of the four subfields of Political Theory, Comparative Politics, International Politics, or American Government by taking the introductory, 1000-level course in that subfield, and at least three 2000-level courses in that subfield. It is recommended that one of those 2000-level courses in the subfield selected by each major should be a seminar.

In meeting the above requirements, students desiring African American emphasis in a program of concentration should consider courses in the following group: 2240, 2255, 2265, 2266. They may also choose to elect the following courses at Fisk University: Political Science 406 (African Political Systems), 245 (Afro-American Political Thought), and 254 (Politics in the Black Community).

**Graduate Courses.** Qualified undergraduates may enroll in graduate courses with the consent of their adviser, the course instructor, and the Graduate School. Undergraduate applicants to enroll in graduate courses need to comply with rules provided under the heading Undergraduate Enrollment in Graduate Courses in this catalog on p. 96.

### Honors Program

To enter the program, students should have completed all but 6 credit hours of the AXLE requirements, and have a minimum overall GPA of 3.6. They should also have a minimum GPA of 3.6 in all the political science courses they have taken up to the point at which they enter the Honors Program. They must have exhibited to the department additional evidence of an

ability to do independent work. Finally, they must be nominated by the director of the undergraduate studies program.

In addition to requirements set by the College of Arts and Science, the following requirements must be met in order for honors in political science to be awarded:

- 30 credit hours in political science, as well as all of the requirements for political science majors.
- 3.6 grade point average in all political science courses, and a 3.6 average in courses that count toward honors in political science.
- Completion of an honors thesis, under the direction of a faculty adviser. Students will enroll in Senior Honors Research (4998 and 4999), during the semester(s) when they work on the honors thesis (at least 3 credit hours each).
- An oral exam on the honors thesis in the last semester of the senior year.

Students in the Honors Program are encouraged to take PSCI 2270 before they enter or during their first semester in the Honors Program.

A three-member Honors Committee will be appointed to administer each student's program. Students should submit the names of a faculty adviser and the other two members of the committee to the director of the Honors Program as soon as possible after they are accepted into the Honors Program. The committee will administer the oral examination, after which it will also decide whether the student will receive honors or highest honors. *Successful candidates are awarded honors or highest honors in their field, and this designation appears in the Commencement program and on their diplomas.*

### Minors in Political Science

The Department of Political Science offers three minors, which are detailed below. Each consists of 18 credit hours (one introductory-level course and five upper-level courses). One of these options may be chosen:

#### Political Theory

1103	3
Any five of the following: 2203, 2205, 2207, 2207W, 2208, 2209, 3253, 4257, 3258, 2262, 3264W, 2270, 3271	15

#### World Politics

A student may stress comparative politics or international politics or may mix the two in this minor.	
1101 or 1102	3
Any five of the following: Comparative Politics: 2210, 3211, 2213, 2215, 2216, 3217, 2219, 2223, 3228, 2230, 3235, 2236, 4238, 2270, 3272W, 3894, Fisk Political Science 406 International Politics: 3211, 2221, 2222, 2223, 2225, 2226, 3228, 3229, 2236, 2270, 3272W, 2273, 2274, 3275, 4277, 3895	15

#### American Politics

1100 or 1150	3
Any five of the following: 2222, 2240, 3241, 2243, 3244, 2245, 3247, 3249, 3250, 2251, 3252, 3253, 3254, 2255, 2259, 3260, 2262, 2265, 2266, 2267, 3268, 2270, 3893	15

## Licensure for Teaching

Candidates for teacher licensure in political science at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Course descriptions begin on page 193.

# Psychology

CHAIR René Marois

DIRECTOR OF UNDERGRADUATE STUDIES Jo-Anne Bachorowski

DIRECTOR OF GRADUATE STUDIES Geoffrey Woodman

DIRECTOR OF CLINICAL TRAINING Bunmi O. Olatunji

PROFESSORS EMERITI William F. Caul, Keith N. Clayton, Ford F. Ebner,

Robert Fox, Jeffery J. Franks, Martin Katahn, Joseph S. Lappin,

Richard D. Odom, William P. Smith, Warren W. Webb

PROFESSORS Randolph Blake, Vivien A. Casagrande, Isabel Gauthier,

Steven D. Hollon, Jon H. Kaas, Gordon D. Logan, Timothy P.

McNamara, René Marois, Richard C. McCarty, Hector Myers, Thomas

J. Palmeri, Sohee Park, Jeffrey D. Schall, Frank Tong, David Zald

ASSOCIATE PROFESSORS Jo-Anne Bachorowski, Denise Davis,

Suzanaerculano-Houzel, Bunmi O. Olatunji, David G. Schlundt,

Andrew J. Tomarken, Geoffrey Woodman

ASSISTANT PROFESSORS Anita Disney, Alexander Maier, Sean Polyn,

Jennifer S. Trueblood

SENIOR LECTURERS Elisabeth H. Sandberg, Adriane E. Seiffert,

Leslie M. Smith

PSYCHOLOGY is the scientific study of brain, behavior, and cognitive processes. At Vanderbilt, the undergraduate program introduces students to the major areas of contemporary psychology: clinical science, human cognition and cognitive neuroscience, developmental psychology, neuroscience, and social psychology. Clinical science studies human personality, emotion, abnormal behavior, and therapeutic treatments. Human cognition and cognitive neuroscience includes the study of processes such as learning, remembering, perceiving environmental objects and events, and neural mechanisms underlying these processes. Developmental psychology examines human development from conception through adulthood, including cognitive, emotional, physical, and social aspects. Neuroscience studies the structure and function of the brain and how nerve cells process sensory information about the environment, mediate decisions, and control motor actions. Social psychology examines interpersonal and intergroup relations and the influence of social conditions on cognitive, emotional, and behavioral processes.

The Department of Psychology offers a general program of study for students who desire a broad background in contemporary psychology, as well as an honors program. The department offers a wide variety of opportunities for undergraduates to gain research experience through active participation in faculty research projects. Such research experience is encouraged as a basic aspect of education in psychology.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Programs of Concentration in Psychology

### General Program

PSY 1200

PSY 2100 or PSY-PC 2110 (Peabody)

PSY 2150

4 Distribution Courses\*

5 Psychology Electives\*\*

**Total credit hours: 36**

### Honors Program

PSY 1200

PSY 2100 or PSY-PC 2110 (Peabody)

PSY 2150

4 Distribution Courses\*

PSY 3980 and/or 3981 and both PSY 4998 and 4999

3 Psychology Electives

Students who only take one semester of PSY 3980 or 3981 will need to take an additional elective course to fulfill their 42 credit hours.

**Total credit hours: 42**

*Honors Program.* The Honors Program is a two-year program that offers qualified majors the opportunity to conduct research projects in collaboration with faculty members. This research culminates in the writing and public presentation of a senior thesis.

The Honors Program offers unusual opportunities for interested and qualified students, including special seminars and individual research projects. The program should substantially aid those intending to do graduate work.

The program requires two years of honors research, and participation in the Honors Seminars, PSY 3980 and/or 3981 and both PSY 4998 and 4999 (at least 9 credit hours total). Under special circumstances (e.g., a semester abroad or student teaching), students may enroll in only three semesters of the Honors Seminars—provided they can complete the research project by extra work during three regular semesters and/or a summer, and provided this arrangement is acceptable to the faculty mentor and to the director of the Honors Program. Students who only take one semester of PSY 3980 or 3981 will need to take an additional elective course to fulfill their 42 credit hours.

Students who are majoring in psychology may apply to the Honors Program at the end of their sophomore year if they have a cumulative grade point average of at least 3.3, both overall and in all courses that count toward the psychology major. Students must also find a faculty mentor who is willing to sponsor them in the program. Students who complete the program successfully and have a final cumulative and major grade point average of 3.3 or higher will receive honors or highest honors in psychology.

#### \* Distribution Courses

(at least 4 of the following 5 courses are required)

The following courses provide grounding in core content areas of experimental psychology.

PSY 3100, 3120, 3110; NSC 2201; PSY-PC 1250 (Peabody)

#### \*\* Electives

Any course in the Department of Psychology (A&S) or the Department of Psychology and Human Development (Peabody) that is not being used to meet another psychology requirement can be used as an elective.

## Comprehensive Exam

In order to graduate with a psychology major, students must take a comprehensive exam during their senior year. Students are expected to take the comprehensive exam in the fall of their senior year (students who are on leave or are studying abroad during the fall semester of their senior year should schedule to take the exam upon their return to campus). The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to test the extent to which psychology majors are retaining core aspects of the psychology curriculum.

## Minor in Psychology

The minor in psychology is intended for those students who want to gain an overview of the science of psychology and its methodological foundations, and to sample more advanced work in the areas of specialization within psychology at Vanderbilt.

Students are required to complete 18 credit hours of course work inside the department, distributed as follows:

Psychology 1200	3
Psychology 2150 and either 2100 or PSY-PC 2110 (Peabody)	6
Two courses from the list of Distribution Courses specified for the major	6
One psychology elective as defined in the psychology major	3

Total credit hours: 18

Independent/Directed Study courses (3850/3850 and 3840/3860) may not be counted as the elective course for minors.

1200 (or 1111, sections 1, 2, and 3) is prerequisite for all other psychology courses except 1111. PSY 1111 – 01, 02, 03 – General Psychology, First-Year Writing Seminar – covers the same material as PSY 1200 and also serves as the introductory prerequisite for all 2000-level courses in psychology. Credit cannot be earned for both PSY 1200 and PSY 1111 – 01, 02, or 03. PSY 1111 – sections 4 and higher – are First-Year Writing Seminars on special topics in psychology. PSY 1111 – sections 4 and higher – do not replace PSY 1200 as a prerequisite for all 2000-level courses in psychology and may be taken in conjunction with PSY 1200.

Note: NSC courses 2201 (Neuroscience), 3235 (Biological Basis of Mental Disorders), 3269 (Developmental Neuroscience), 3270 (Computational Neuroscience), 3272 (Structure and Function of the Cerebral Cortex), and 3274 (Neuroanatomy) count as courses in the Department of Psychology (A&S). See the Neuroscience course listings for descriptions of these classes.

Course descriptions begin on page 197.

# Public Policy Studies

DIRECTOR Katherine Carroll (Political Science)

ADVISORY BOARD Kathryn Anderson (Economics), Jay Clayton (English), David Lewis (Political Science)

Affiliated Faculty

VISITING PROFESSOR David Manning

ADJUNCT PROFESSOR Bill Purcell

ASSOCIATE PROFESSOR Zdravka Tzankova (Sociology)

ASSISTANT PROFESSOR OF THE PRACTICE Jennifer Novak-Leonard

SENIOR LECTURER Carrie A. Russell (Political Science)

STUDENTS may choose an interdisciplinary program of concentration in public policy studies. The major requires students to take courses in government, ethics, and social science. In addition, students develop analytical skills through course work in research methodology, statistics, and economics. Each student also chooses a policy track, an area of public policy they want to explore in depth.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Program of Concentration in Public Policy Studies

The interdisciplinary major requires 39 credit hours of course work divided into two parts: 24 credit hours of required core courses and 12 credit hours of elective courses focusing on one substantive policy area. A student contemplating a major in public policy studies must either have AP credit in or take the following prerequisites: PSCI 1100, 1101, 1102, or 1150; ECON 1010 and 1020. Individual courses included in the program may specify additional prerequisites. If one of the required courses is not offered, students may substitute with the permission of their major adviser.

### I. Core Courses (24 credit hours)

1. *General* (3 credit hours): HOD 2700, Public Policy; PSCI 2256, Politics of Public Policy; or PSCI 2255, Introduction to Public Policy.
2. *Research Methods* (3 credit hours): HOD 2500, Systematic Inquiry; PSCI 2270, Conducting Political Research; or SOC 3002, Introduction to Social Research.
3. *Statistics* (3 credit hours): ECON 1500, Economic Statistics; ECON 1510, Intensive Economic Statistics; SOC 2100, Statistics for Social Scientists; or both MATH 2820, Introduction to Probability and Mathematical Statistics, and Math 2820L, Statistics Laboratory; or PSY-PC 2110, Introduction to Statistical Analysis.
4. *Ethics* (3 credit hours): PSCI 3253, Ethics and Public Policy; or PSCI 2208, Law, Politics and Justice.
5. *Public Finance* (3 credit hours): HOD 3225, Introduction to the Public Finance of Education; or ECON 3200, Public Finance (prerequisite ECON 3010).
6. *Government* (3 credit hours): any upper-level Political Science course.
7. *Economics* (3 credit hours): any upper-level Economics (ECON) course except 3200.
8. *Society and Culture* (3 credit hours): any upper-level Sociology (SOC) course, excluding 3002 and 3003; or any Anthropology (ANTH) course above 2602, excluding language classes. Certain humanities courses may also be counted with the permission of the major adviser.

### II. Policy Track (12 credit hours)

The track is intended to allow students to go more deeply into one area of public policy (for example: health policy, STEM policy, education policy, criminal justice policy). Each student is free to choose and design his or her own track with the advice and approval of the program director. Classes should generally be upper-level and should represent at least two disciplines.

### III. Capstone Seminar (3 credit hours)

PPS 4960, Senior Seminar on Research in Public Policy, is required of all Public Policy majors and is taken during their last year.

Total: 39 credit hours

Course descriptions begin on page 198.

## Religious Studies

CHAIR Tony K. Stewart  
 ACTING CHAIR Richard McGregor  
 DIRECTOR OF UNDERGRADUATE STUDIES IN RELIGIOUS STUDIES  
 Richard McGregor  
 DIRECTOR OF UNDERGRADUATE STUDIES IN ISLAMIC STUDIES  
 Richard McGregor  
 DIRECTOR OF GRADUATE STUDIES James Byrd (Divinity)  
 CHAIR, GRADUATE DEPARTMENT OF RELIGION Paul DeHart (Divinity)  
 PROFESSORS EMERITI Lewis V. Baldwin, Charles H. Hambrick,  
 Daniel M. Patte  
 PROFESSORS Volney P. Gay, Laurel Schneider, Tony K. Stewart  
 ASSOCIATE PROFESSOR Richard McGregor  
 ASSISTANT PROFESSORS Dianna Bell, Nancy G. Lin, Bryan Lowe,  
 Anand Taneja, Alexis S. Wells  
 SENIOR LECTURERS M. Issam Eido, Bushra Hamad

THE Department of Religious Studies approaches religion as a fundamentally human experience. The academic study of religion begins descriptively by exploring religious commitments, identities, practices, worldviews, and institutions. Our courses investigate religious traditions through varied theoretical and methodological approaches that generate a complex understanding of religious perspectives from an array of disciplines such as anthropology, sociology, history, theology, literature, and art.

Students majoring in religious studies gain a deep knowledge of a single tradition, region, or theme and a broad understanding of religions around the world. Successful students develop a highly portable analytical skill set that equips them to pursue graduate degrees in religion or cognate disciplines, as well as professional degrees and careers in fields such as law, diplomacy, medicine, and business. It also provides an excellent second major for a variety of disciplines that address the human condition including neuroscience; sociology; history; medicine, health, and society; and others. Majors will gain the ability to reason intelligently about one of the most difficult and sensitive topics in any society. By virtue of the variety of religious cultures studied, the training will deepen students' mutual understanding and sensitivity to prepare them to become truly responsible global citizens.

The program offers a major (31 credit hours), an Honors Program, a minor (18 credit hours) in religious studies, and a minor (20 credit hours) in Islamic studies.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Religious Studies

31 credit hours. The program of concentration in religious studies seeks to introduce students to the rich diversity of religious traditions in the world (*breadth* component) and to build depth of study in areas of specific interest to the student (*depth* component). In addition, the curriculum includes instruction in the range of theories and methods used to approach religious traditions academically (*tools of the discipline* component). The student will then be able to pursue individual interests (*electives*).

A maximum of two courses (6 credit hours) outside of the department may count toward the major. Of these, one course (3 credit hours) outside of the department may count toward the Depth Component. A foreign language course approved as an elective is *not* subject to the two-course (6 credit hours) limit. No course may be used to satisfy more than one of the four components of the major.

#### 1. Breadth Component (9 credit hours)

Ensures a familiarity with the rich diversity of religious traditions in the world.

- a. **Encountering religious diversity.** 3 credit hours. RLST 1010. An introduction to the field of religious studies and select traditions.
- b. **Introductory course in African or Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in the Mediterranean, Middle East, Africa, or the Americas (including but not limited to Judaism, Christianity, Islam, Egyptian religions, traditions of Sub-Saharan Africa, Native American traditions). RLST 1100, 1200, 1208, 1309, 1500. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.
- c. **Introductory course in Asian or non-Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in Asia or the Pacific (including but not limited to Hindu and Buddhist traditions and those religious traditions originating in East and South Asia). RLST 1637, 1700, 1710, 2644, 2664. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.

#### 2. Depth Component (9 credit hours)

The Depth Component is organized according to three tracks: *traditions*, *geographies*, and *theories and themes*. The introductory course taken to satisfy the breadth requirement cannot be double-counted in this category. The student must choose 9 credit hours from *one* of the following tracks. An appropriate First-Year Writing Seminar RLST 1111 may count toward any track with the approval of the director of undergraduate studies in Religious Studies.

- a. **Traditions.** Allows students to focus on a particular religious tradition or related cluster of traditions that may transcend geographic limitations.

**Buddhist Traditions:** RLST 1700, 1710, 1637, 2644, 3669, 3670W, 3749, 3753, 375; ASIA 3633

**Christian Traditions:** RLST 1309, 1330W, 1820, 2310, 3119, 3304W, 3306, 3312, 3313, 3316; HIST 1760, 2250

**Hindu Traditions:** RLST 2664, 4665, 4666

**Indigenous Traditions:** RLST 1637, 3178, 3890, 4774

**Islamic Traditions:** RLST 1500, 2461, 3561, 4551, 4552, 4554, 4562; ARA 3301; HIST 1190, 2140, 2190

**Jewish Traditions:** RLST 1200, 1208, 2210, 2210W, 3270; JS 1002, 1002W, 1200, 2300, 2330, 2620; PHIL 2102

- b. **Geographies.** Gives students the option of focusing on regional cultures, histories, and religions, as well as relationships between religious traditions within a specific region.

**Africa, West Asia, and the Mediterranean:** RLST 1208, 1330W, 1500, 2461, 2471, 2472, 3312, 3890, 4562; ARA 3301; HIST 1190, 2190

**The Americas:** RLST 1100, 1190W, 3119, 3142, 3178, 3304; HIST 2530

**East Asia:** RLST 1700, 1710, 3747, 3749, 3753, 3670W, 3775, 4774; ASIA 3633

**South/Southeast Asia:** RLST 1500, 1637, 2644, 2664, 3561, 3669, 3670W, 4665, 4666

- c. **Theories and Themes.** Enables students to focus on theoretical, scientific, or thematic questions that may cross both traditional and geographic lines.

**Religion in the literary and visual arts:** RLST 2881, 2940, 3669, 3775, 4665, 4774, 4939

**Theories of religion, science, and/or psychology:** RLST 1820, 2472, 3079, 3940, 3941, 4834, 4835, 4837; JS 2330; ANTH 3141

### 3. Tools of the Discipline Component (4–6 credit hours)

Key issues in the study of religion and a formal introduction to the theories and methods in the academic study of religion.

- a. **Theory and Method.** 3 credit hours. RLST 4960W “Approaches to the Academic Study of Religion.” Recommended for juniors, but may be taken earlier with permission of director of undergraduate studies in Religious Studies.
- b. **Majors Colloquium.** 1 credit hour (may be taken a total of three times). RLST 4970 “Majors Colloquium.” Initiation into the range of professional activities in the study of religion from the craft of research to the production of papers, articles, and theses, coupled with targeted theoretical concerns relevant to the research of the students enrolled in that particular class.

### 4. Electives (9 credit hours)

- a. Electives may be drawn from any of the courses listed under the three components of the major (*Breadth*, *Depth*, and *Tools of the Discipline*). Students may elect to deepen an area of study or they may build additional breadth in other traditions, regions, or themes.
- b. One relevant language course (at least 3 credit hours) may count, with the approval of the director of undergraduate studies in Religious Studies. This course is not subject to the two-course (6 credit hours) limit on courses taken outside the department.

### Honors in Religious Studies

The honors thesis provides an opportunity for highly motivated and exceptionally capable students to engage in independent work on a topic in religious studies. Honors theses require original research with primary sources and extensive use of relevant secondary scholarship, both with regard to the narrowly defined topic of the thesis and on the larger theoretical and methodological issues in the academic study of religion. 3.3 GPA in courses toward the major and cumulative 3.3 GPA are required for entry and must be maintained for completion of honors. Students work closely with faculty members in designing, researching, and writing a thesis beginning in the second semester of their junior year in order to present the thesis at the end of the second semester of their senior year, culminating in a final oral examination on the thesis.

- a. **Research and Writing.** 6 credit hours. RLST 4998–RLST 4999 “Seniors Honors Thesis.” RLST 4998 and RLST 4999 count as 6 of the 9 credit hours of the elective component of the major.
- b. **Majors Colloquium – Co-requisite with RLST 4999.** RLST 4970 “Majors Colloquium” in the second semester of senior year, in which candidate must present results of research. Honor program candidates shall take 4970 co-requisite with 4999. Initiation into the range of professional activities in the study of religion from the craft of research to the production of papers, articles, and theses, coupled with targeted theoretical concerns relevant to the research of the students enrolled in that particular class.

### Minor in Religious Studies

18 credit hours. The minor will introduce the rich diversity of religious traditions (Breadth component), initiate depth in at least one tradition (Depth component), and encourage further exploration of different perspectives or traditions through electives. A maximum of one course (3 credit hours) from outside the department may count if it is included in any of the three components of the major (Breadth, Depth, and Tools of the Discipline). No course may be used to satisfy more than one of the three components of the minor.

#### 1. Breadth Component (9 credit hours)

Ensures a familiarity with the rich diversity of religious traditions in the world.

- a. **Encountering religious diversity.** 3 credit hours. RLST 1010 Encountering Religious Diversity. An introduction to the field of religious studies and select traditions.
- b. **Introductory course in African or Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in the Mediterranean, Middle East, Africa, or the Americas (including but not limited to Judaism, Christianity, Islam, Egyptian religions, traditions of Sub-Saharan Africa, Native American traditions). RLST 1100, 1200, 1208, 1309, 1500. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.
- c. **Introductory course in Asian or non-Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in Asia or the Pacific, including

but not limited to Hindu and Buddhist traditions and those religious traditions originating in East and South Asia. RLST 1637, 1700, 1710, 2644, 2664. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.

## 2. Depth Component (3 credit hours)

- **Deepening the study of one tradition. 3 credit hours.**  
The student must choose one of the two religious traditions used to meet the introductory course Breadth Component to delve further into that religion.

## 3. Electives (6 credit hours)

- Electives may be drawn from any of the courses listed under the three components of the major (Breadth, Depth, and Tools of the Discipline). Students may elect to deepen an area of study or they may build additional breadth in other traditions, regions, or themes.
- With the permission of the director of undergraduate studies in Religious Studies and a minimum 3.3 GPA in the minor, the student may take the Majors Colloquium RLST 4970.

### Minor in Islamic Studies

**20 credit hours.** Students complete a required minimum of 20 credit hours from the list below, which must include Arabic 1102, Elementary Arabic; Religious Studies 1500, Introduction to Islam; and Religious Studies 4554, The Qur'an and Its Interpreters. The maximum number of credit hours to be counted toward the minor from Arabic language courses is 9. No credit hours will be counted for Arabic 1101.

ARABIC: 1102, Elementary Arabic; 2201–2202, Intermediate Arabic; 3101–3102, Advanced Arabic; 3201, Media Arabic; 3301, Arabic of the Qur'an and Other Classical Texts.

CLASSICS: 3010, The Ancient Origins of Religious Conflict in the Middle East.

HISTORY: 1111, First-Year Writing Seminar (when related to Islamic history or culture as determined by the director of undergraduate studies); 1160, Modern South Asia; 1190, A History of Islam; 1200, The Arab Spring; 1270, Sub-Saharan Africa: 1400–1800; 1280, Africa since 1800: The Revolutionary Years; 2140, The Mughal World; 2150, India and the Indian Ocean; 2155, Muhammad and Early Islam; 2170, Islam and the Crusades; 2190, Last Empire of Islam; 3150, Cities of Europe and the Middle East; 3210, Muslims, Christians, and Jews in Medieval Spain.

JEWISH STUDIES: 2600, Islam and the Jews.

PHILOSOPHY: 2102, Medieval Philosophy; 3006, Islamic Philosophy.

POLITICAL SCIENCE: 2203, Middle East Politics; 3896, Selected Topics (when related to Islamic politics or culture as determined by the director of undergraduate studies).

RELIGIOUS STUDIES: 1500, Introduction to Islam; 1111, First-Year Writing Seminar (when related to Islamic religion or culture as determined by the director of undergraduate studies); 4551, Islamic Mysticism; 4552, Reformers of the Islamic Tradition; 4554, The Qur'an and Its Interpreters; 4562, Culture, Religion, and Politics of the Arab World; 4666, Devotional Traditions of South Asia: Hindu, Muslim, Sikh; 4592, Advanced Seminar in Arabic; 4593, Advanced Seminar in Islamic Tradition.

**Course descriptions begin on page 198.**

# Scientific Computing

DIRECTORS Robert E. Bodenheimer (Computer Science), Thomas J. Palmeri (Psychology), David A. Weintraub (Physics and Astronomy)

Affiliated Faculty

PROFESSORS Ralf Bennartz (Earth and Environmental Sciences), Gautam Biswas (Electrical Engineering and Computer Science), Mario Crucini (Economics), Peter T. Cummings (Chemical and Biomolecular Engineering), Mark N. Ellingham (Mathematics), David Furbish (Earth and Environmental Sciences), Shane Hutson (Physics), Gordon D. Logan (Psychology), Terry P. Lybrand (Chemistry and Pharmacology), Charles F. Maguire (Physics), Clare M. McCabe (Chemical and Biomolecular Engineering), Jens Meiler (Chemistry), Michael I. Miga (Biomedical Engineering), Mark Neamtu (Mathematics), Thomas J. Palmeri (Psychology and Neuroscience), Antonis Rokas (Biological Sciences and Biomedical Informatics), Jeffrey D. Schall (Psychology and Neuroscience), Larry Schumaker (Mathematics), Paul Sheldon (Physics), David A. Weintraub (Astronomy), Robert Weller (Electrical Engineering)

ASSOCIATE PROFESSORS Andreas A. Berlind (Astronomy), Robert E. Bodenheimer (Computer Science), Guilherme Gualda (Earth and Environmental Sciences), Kelly Holley-Bockelmann (Astronomy), Haoxiang Luo (Mechanical Engineering), Sean Polyn (Psychology and Neuroscience), Kalman Varga (Physics), Greg Walker (Mechanical Engineering), Steve Wernke (Anthropology)

ASSISTANT PROFESSORS Tony Capra (Biological Sciences), Bennett Landman (Electrical Engineering), Carlos Lopez (Cancer Biology), Jennifer Trueblood (Psychology), William Holmes (Physics and Astronomy)

ADJUNCT ASSISTANT PROFESSOR William R. French (Chemical and Biomolecular Engineering)

ASSOCIATE PROFESSOR OF THE PRACTICE Gerald H. Roth (Computer Science)

THE College of Arts and Science and the School of Engineering offer an interdisciplinary minor in scientific computing to help students in the physical, biological, and social sciences as well as engineering acquire the ever-increasing computational skills that such careers demand. Students who complete this minor will have a toolkit that includes programming skills useful for simulating physical, biological, and social dynamics as well as an understanding of how to take advantage of modern software tools to extract meaningful information from small and large data sets.

Computation is now an integral part of modern science. Computer simulation allows the study of natural phenomena impossible or intractable through experimental means. Astronomers studying the formation of massive black holes, neuroscientists studying brain networks for human memory, economists studying effects of regulation on market dynamics, and biochemists studying the three-dimensional structure of proteins are united in many of the computational challenges they face and the tools and techniques they use to solve these challenges.

Students pursuing the scientific computing minor are taught techniques for understanding such complex physical, biological, and social systems. Students are introduced to computational methods for simulating and analyzing models of complex systems, to scientific visualization and data mining techniques needed to detect structure in massively large multidimensional data sets, to high-performance computing techniques for simulating models on computing clusters with hundreds or thousands of parallel, independent processors and for analyzing terabytes or more of data that may be distributed across a massive cloud or grid storage environment.

The scientific computing minor at Vanderbilt is supported by faculty and includes students from a wide range of scientific and engineering disciplines. While the content domain varies, these disciplines often require similar computational approaches, high-performance computing resources, and skills to simulate interactions, model real-life systems, and test competing hypotheses. Scientific computing embodies the computational tools and techniques for solving many of the grand challenges facing science and engineering today.

The minor in scientific computing prepares students for advanced course work that combines computational approaches with a substantive area of science or engineering. It prepares students for directed or independent study with a faculty member on a research project. It prepares students for advanced study in graduate school. It provides skills that will be attractive to many employers after graduation.

The minor in scientific computing is distinct from the minor in computer science. Scientific computing uses computation as a tool to solve scientific and engineering problems in research and application. It is more focused on simulation, numerical techniques, high performance computing, and higher-level methods than the minor in computer science, which is focused on the algorithms, systems, and technologies that enable such methods to be developed and employed.

Details of the minor requirements are provided in the School of Engineering section of the catalog, and are also available at [vanderbilt.edu/scientific\\_computing](http://vanderbilt.edu/scientific_computing).

## Sociology

CHAIR Larry W. Isaac

DIRECTOR OF UNDERGRADUATE STUDIES David J. Hess

DIRECTOR OF GRADUATE STUDIES Richard Pitt

PROFESSORS EMERITI Karen E. Campbell, Jack P. Gibbs, Walter R.

Gove, Gary F. Jensen, Ronnie Steinberg, R. Jay Turner

PROFESSORS Daniel B. Cornfield, David J. Hess, Larry W. Isaac, Holly J.

McCammon, Jonathan M. Metz

ASSOCIATE PROFESSORS George Becker, Laura M. Carpenter, André

Christie-Mizell, Shaul Kelner, Richard Lloyd, Richard Pitt, Mariano

Sana, Lijun Song, Zdravka Tzankova

ASSISTANT PROFESSORS Joshua Murray, Evelyn Patterson, LaTonya

Trotter

SENIOR LECTURERS Joe Bandy, Rosevelt Noble

LECTURERS Amy Cooter, Terrie Spetalnick, Laurie Woods

SOCIOLOGY, the study of social consensus, conflict, and change, offers students a better understanding of society and the meaning of social interaction. The department's courses cover a wide range of sociological themes including arts, culture, and religion; cities, states, and political economy; deviant behavior and crime; gender and sexuality; health and the life course; race, ethnicity, and immigration; social movements, politics, and power; environment and population; and work, labor, and occupations. Undergraduate courses in sociology prepare students for graduate work or provide further preparation for a career in law, medicine, business, research, education, the ministry, nursing, social work, or civil service. Two major programs are available. Students may declare only one of the majors offered by the Department of Sociology; double majors within the department are not permitted.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Sociology

Students majoring in sociology are required to complete 33 credit hours of work in sociology (36 credit hours for students in the Honors Research Track). The major consists of five types of courses as listed below: introduction, theory, research skills, core areas, and electives.

Course work for the major is distributed as follows:

#### Program I (Standard Track)

A total of 33 credit hours as follows:

- 1) *Introduction*: Sociology 1010, 1010W, 1020, or 1020W 3
- 2) *Theory*: Sociology 3001 3
- 3) *Research Skills*: Sociology 3002 (or HOD 2500 for students who double major in sociology and HOD) 3
- 4) *Core Areas* 9

Students must take at least one course in three of the four core areas listed below. A course cannot be used to satisfy more than one requirement in the major.

#### *Culture, Institutions, and Socialization*

Sociology 3201, 3202, 3203, 3204, 3205, 3206, 3221, 3222, 3223, 3224, 3231, 3232, 3233

#### *Health, Environment, Population, and Migration*

Sociology 3301, 3302, 3303, 3304, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3321, 3322; Environmental and Sustainability Studies 4101; Medicine, Health, and Society 2310, 2430

#### *Politics, Law, and Conflict*

Sociology 3233, 3601, 3602, 3603, 3604, 3605, 3611, 3612, 3613, 3614, 3615, 3616, 3621, 3622, 3623, 3624; Jewish Studies 2560

#### *Race, Ethnicity, and Gender*

Sociology 3601, 3615, 3616, 3701, 3702, 3703, 3704, 3711, 3722, 3723, 3724; Jewish Studies 2400, 2450

- 5) *Electives* 15

Any 5 sociology courses not used to satisfy the above requirements. SOC 2100 or its equivalent may be counted toward the electives. (Equivalent courses are ECON 1500 or 1510 or MATH 1011 or 2820. Students who double major in sociology and psychology or in sociology and the Peabody majors of human and organizational development, child development, cognitive studies, or child studies may also choose from PSY 2100 or PSY-PC 2110.) Electives may also include only one of the following 1000-level sociology courses: Sociology 1041, 1041W, or 1111. No other 1000-level sociology course may be counted toward the electives requirement of the major except by permission of the director of undergraduate studies. The Department of Sociology advises students to group their elective sociology courses in a cluster of advanced concentration electives to be selected with the student's adviser. See the director of undergraduate studies or the departmental website for suggested clusters: [as.vanderbilt.edu/sociology/undergraduate/major](http://as.vanderbilt.edu/sociology/undergraduate/major).

### Program II (Honors Research Track)

A total of 36 credit hours as follows:

The Honors Research Track offers superior majors in sociology the opportunity to pursue intensive work through an independent research project. Students interested in pursuing the Honors Research Track in Sociology should contact the director of undergraduate studies for more information. To be considered for the Honors Research Track in Sociology, a student must have a minimum cumulative GPA of 3.3 and a minimum GPA of 3.3 for courses that count toward the sociology major. Students who are recommended for the program by the director of undergraduate studies will typically begin the program in the first semester of their junior or senior year.

The Honors Research Track in Sociology requires:

- 1) Successful completion of requirements 1–4 in Program I, for a total of 18 credit hours.
- 2) Successful completion of the statistics requirement: SOC 2100 or its equivalent (defined in requirement 5 of Program I).
- 3) Completion of 12 credit hours of elective courses. The statistics requirement is counted toward the electives. Electives may include only one of the following 1000-level sociology courses: Sociology 1041, 1041W, or 1111. No other 1000-level sociology course may be counted toward the electives requirement of the major except by permission of the director of undergraduate studies. If students take more than 6 credit hours of SOC 4981, the additional credit hours (7–12) are counted toward the elective courses.
- 4) Successful completion of at least two semesters of SOC 4981 (Honors Research). The first semester of 4981 (Honors Research) is a 3 credit hour seminar in which students develop the literature review and research plan for the honors thesis. In the second semester of 4981 (Honors Research), also for 3 credit hours, students must complete the research and data collection, data analysis, and initial write-up of results of the thesis. Students may elect to take a third or fourth semester of 4981 during their senior year, when they may, for example, work on revisions of the project and/or on publication. Students who begin the Honors Track in their senior year may also take more than 6 credit hours of 4981, up to a maximum of 12 credit hours.
- 5) Successful defense of the completed thesis through an oral defense attended by the chair and reader of the thesis; this oral defense typically takes place during the second semester of the student's senior year. In order to earn honors in sociology, students must successfully complete and defend an honors thesis before graduation.

### Comprehensive Exam

In order to graduate with a sociology major, students must take a comprehensive exam during their senior year. The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to test the extent to which sociology majors are retaining core aspects of the sociology curriculum.

### Program of Concentration in Environmental Sociology

Environmental sociology is the study of the relationship between modern societies and the environment at a variety of scales, from households to global relations. It includes issues such as public understanding of environmental issues, the environment and inequality, environmental social movements and social change, and analysis of environmental reform and adaptation. Environmental sociology is different from

environmental science, which is based in the natural sciences, and environmental studies, which includes courses from a wide range of disciplines, including engineering and the humanities. The department's program in environmental sociology includes a solid introduction to sociology and sociological methods as well as foundation requirements in environmental science. The program prepares students for careers in government, the law, management, research and teaching, and the nonprofit sector.

Students majoring in environmental sociology are required to complete 33 credit hours of course work. The major consists of four types of courses: foundation social science courses, foundation environmental science courses, research skills, and environmental sociology courses.

### Program I (Standard Track)

A total of at least 33 credit hours as follows:

- 1) *Foundation Courses in Sociology* 6 credit hours  
SOC 1020 or 1020W, SOC 3001
- 2) *Foundation Courses in Environmental Sciences* at least 6 credit hours  
Two courses from EES 1510,\*\* 1030, 1070, 1080, 1140, 1111,\*\* 2110,\* 2150, 2510,\* 3220,\* 4680,\* 4750,\* 4820,\* at least one of which must address climate-related issues (EES 1080, 1140, 2110,\* 2150, 2510,\* 4680,\* 4820,\* or another EES course as approved by the director of undergraduate studies of Environmental Sociology).  
\*Requires EES 1510 and the lab EES 1510L as prerequisites.  
\*\*1111s require permission of the director of Environmental Sociology.
- 3) *Research Skills* 6 credit hours  
SOC 2100 (or other statistics course approved by the director of undergraduate studies of Environmental Sociology) followed by or concurrent with SOC 3002 or HOD 2500 for those majoring in HOD.
- 4) *Environmental Sociology Core* 15 credit hours  
15 credit hours selected from the following:  
SOC 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3321, 3604, 3605, 3881,\* 4961;\* ENV5 4101  
\*As approved by the director of undergraduate studies of Environmental Sociology

### Program II (Honors Research Track in Environmental Sociology)

A total of at least 36 credit hours as follows:

The Honors Research Track offers superior majors in environmental sociology the opportunity to pursue intensive work through an independent research project. Students interested in pursuing the Honors Research Track in Environmental Sociology should contact the director of undergraduate studies of Sociology for more information. To be considered for the Honors Research Track in Environmental Sociology, a student must have a minimum cumulative GPA of 3.3 and a minimum GPA of 3.3 for courses that count toward the environmental sociology major. Students who are recommended for the program by the director of undergraduate studies of Sociology will typically begin the program in the first semester of their junior or senior year.

The Honors Research Track in Environmental Sociology requires:

- 1) Successful completion of requirements 1 through 3 in the Standard Track.
- 2) At least 12 credit hours from requirement 4 in the Standard Track.



- 3) Successful completion of at least two semesters of SOC 4981 (Honors Research). The first semester of 4981 (Honors Research) is a 3 credit hour seminar in which students develop the literature review and research plan for the honors thesis. In the second semester of 4981 (Honors Research), also for 3 credit hours, students must complete the research and data collection, data analysis, and initial write-up of results of the thesis. Students may elect to take a third or fourth semester of 4981 during their senior year, when they may, for example, work on revisions of the project and/or on publication. Students who begin the Honors Program in their senior year may also take more than 6 credit hours of 4981, up to a maximum of 12 credit hours.
- 4) Successful defense of the completed thesis through an oral defense attended by the chair and reader of the thesis; this oral defense typically takes place during the second semester of the student's senior year. To earn honors in environmental sociology, students must successfully complete and defend an honors thesis before graduation.

### *Comprehensive Exam*

In order to graduate with an environmental sociology major, students must take a comprehensive exam during their senior year. The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to test the extent to which majors are retaining core aspects of the environmental sociology curriculum.

### *Minor in Sociology*

The minor in sociology is intended for those students who want to gain an overview of the discipline and to sample some of the special lines of study in it.

Students are required to complete 18 credit hours of course work inside the department, distributed as follows:

- |   |    |
|---|----|
| 1. Sociology 1010, 1010W, or 1020, 1020W  | 3  |
| 2. Sociology 3001   | 3  |
| 3. Four courses, including at least one from three of the four core areas listed in above major | 12 |

Total credit hours: 18

### *Licensure for Teaching*

Candidates for teacher licensure in sociology at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

**Course descriptions begin on page 203.**

## *Spanish and Portuguese*

CHAIR Benigno Trigo  
 VICE CHAIR Victoria A. Burrus  
 DIRECTOR OF UNDERGRADUATE STUDIES María Paz Pintané  
 DIRECTOR OF GRADUATE STUDIES Andrés Zamora  
 PROFESSORS EMERITI M. Frãncille Bergquist, Susan Berk-Seligson, C. Enrique Pupo-Walker  
 PROFESSORS Earl E. Fitz, Edward H. Friedman, Ruth Hill, Cathy L. Jade, William Luis, Philip D. Rasico, Benigno Trigo

ASSOCIATE PROFESSORS Victoria A. Burrus, Christina Karageorgou-Bastea, Emanuelle Oliveira-Monte, Andrés Zamora  
 ASSISTANT PROFESSORS José Cárdenas Bunsen, N. Michelle Murray  
 SENIOR LECTURERS Frances Alpren, José Luis Aznar, Lorraine Catanzaro, Rachel R. Chiguluri, Sarah Delassus, Heraldo Falconi, Victoria Gardner, Chalene Helmuth, Clint Hendrix, Stacey Johnson, Benjamin Legg, Alicia Lorenzo-García, Patrick Murphy, Elena Olazagasti-Segovia, Amarilis Ortiz, Carolina Palacios, María Paz Pintané, Cynthia M. Wasick, Katherine Wesolek

THE Department of Spanish and Portuguese offers a wide range of courses in the language, culture, and literature of Spain and Spanish America and is well known for its program in Portuguese and Brazilian studies. Intensive Elementary Catalan is also offered.

The department offers programs of concentration in both Spanish and Spanish and Portuguese. Majors take courses in language, literature, linguistics, and culture. Interdisciplinary majors are available in Spanish and European Studies or in Spanish, Portuguese, and European Studies. Qualified Spanish majors may elect to take graduate courses in their senior year or participate in honors work. Minors in Spanish and in Portuguese are also offered.

The department serves majors from the Center for Latin American Studies and the Max Kade Center for European and German Studies. On the graduate level, the department offers the master of arts in both Spanish and Portuguese, a doctoral program in Spanish, and a combination doctoral degree in Spanish/Portuguese.

Many students participate in Vanderbilt programs in Barcelona, Palma de Mallorca, Argentina, Chile, Cuba, the Dominican Republic, and Brazil. Maymasters in Spain and Peru are also offered. Activities organized by the department include lectures, films, and symposia. The department has a chapter of the national honor society Sigma Delta Pi for students of Spanish. Students are encouraged to apply for living space in the Spanish Hall of McTyeire International House.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Spanish*

The major consists of 30 credit hours in Spanish courses numbered 3301W and above. The distribution requirements are as follows:

1. *Core requirements:* 3301W, 3302, and 3303.
2. *Literature:* Nine credit hours from courses numbered 4400–4980 or 3835 or 3893.
3. *Linguistics:* Three credit hours from courses numbered 4300–4360 or 3892.
4. *Electives:* Nine credit hours from courses numbered 3320–3835 or 3891–4980. Students may substitute 3 credit hours of a language course in either Portuguese (1103 or higher) or Catalan (1103 or higher).

A more advanced composition course may be substituted for 3301W. A more advanced conversation course may be substituted for 3302. Spanish 3303 is the prerequisite for all literature courses offered by the department. Students must take Spanish 3301W, 3302, and 3303 in order to participate in most study abroad programs. Seniors are eligible to take one or two graduate-level courses (7000 and above) with the approval of the instructor and the chair of the department.

### Honors Program in Spanish

Candidates for honors in Spanish who meet college and departmental requirements must complete 36 credit hours in Spanish courses numbered 3301W and above. Students satisfy the requirements of the 30-credit-hour major in Spanish, in which one of the required literature courses is either the undergraduate seminar, Spanish 4980 (3 credit hours), which may be taken during either the junior or senior year, or a graduate seminar (course numbered 7000–9520) approved by the adviser to the Honors Program, which may only be taken during the senior year. (If Spanish 4980 has not been available, it may, with permission of the adviser to the Honors Program, be substituted by an “enriched” undergraduate literature course in which the instructor assigns outside research and a second or longer term paper to an honors candidate.)

The remaining 6 credit hours of the honors major consist of a senior honors thesis, which is completed during the senior year as independent study (Spanish 4998–4999) under the direction of a faculty adviser. Candidates must submit a proposal for the thesis to their prospective faculty adviser no later than the second semester of their junior year. The completed thesis must be submitted within the second semester of the senior year (deadlines are available from the department). An oral examination on the thesis and the general area of research, administered by a committee of the department, will follow.

### Minor in Spanish

The minor in Spanish consists of a minimum of 18 credit hours. The specific requirements are as follows:

Spanish 3301W (A more advanced composition course may be substituted)	3
Spanish 3302 (A more advanced conversation course may be substituted)	3
Spanish 3303	3
Three credit hours of advanced Spanish literature chosen from courses numbered from 4400–4980 or 3835 or 3893	3
Six credit hours of electives chosen from Spanish courses numbered 3320–3835, 3891–4980	6
Total credit hours: 18	

### Minor in Portuguese

The minor in Portuguese consists of a minimum of 15 credit hours. The specific requirements are as follows:

Portuguese 2203 (Intermediate Portuguese; a more advanced language course may, subject to approval by the department, be substituted)	3
One of the following two courses: Portuguese 3301 (Portuguese Composition and Conversation) or Portuguese 3302 (Brazilian Pop Culture)	3
Portuguese 3303 (Introduction to Luso-Brazilian Literature)	3
At least one of the following two courses: Portuguese 4420 (Brazilian Literature through the Nineteenth Century) or Portuguese 4425 (Modern Brazilian Literature)	3

At least 3 additional credit hours selected from among the courses listed below (or a graduate course numbered 7000–9520 for qualified seniors; procedures may be found in the Academic Regulations section of the Undergraduate Catalog).

Portuguese 4350 (Brazilian Culture through Native Material), 4420 (Brazilian Literature through the Nineteenth Century), 4425 (Modern Brazilian Literature), 3892 (Special Topics in Portuguese Language, Literature, and Civilization)	3
Total credit hours: 15	

### Program of Concentration in Spanish and Portuguese

This major focuses on the two dominant languages (Spanish and Portuguese) of the Iberian Peninsula and Latin America and their literatures and cultures. The basic requirement for this major is a minimum of 33 credit hours in Spanish and Portuguese. The distribution is as follows:

1. Core requirements of Spanish 3301W, 3302, and 3303; Portuguese 2203, 3301 (or 3302), and 3303.
2. At least two Spanish courses numbered between 3320–3375 or 4400–4980 or 3891 or 3893.
3. At least two of the following Portuguese courses: 3892, 4350, 4420, 4425, 7070, 7071, and 9520.
4. One additional elective to be chosen from the courses listed under area 2 and 3 above.

A student who studies abroad may be able to substitute similar culture or literature courses with the permission of the director of undergraduate studies.

### Program of Concentration in Spanish and European Studies

Students pursuing the interdisciplinary major in Spanish and European studies combine their focus on Spanish language and literature with a study of modern Europe in its political, economic, and cultural diversity. Students may elect this interdisciplinary major, which requires a minimum of 42 credit hours of course work. A semester of study abroad in Spain is recommended. Course work for the major is distributed as follows:

#### Spanish (27 credit hours)

Spanish language and literature core courses (9 credit hours): Spanish 3301W, 3302, and 3303 (a more advanced composition course may be substituted for 3301W; a more advanced conversation course may be substituted for 3302)

Spanish culture and civilization (6 credit hours): Two of the following: Spanish 3320, 3325, 3360, 3365, 3891

Spanish literature (6 credit hours): Two Spanish courses numbered from 4400–4980 or 3835 or 3893

Elective (6 credit hours): Two additional Spanish courses that count toward the Spanish major. Students may substitute 3 credit hours of a language course in either Portuguese (1103 or higher) or Catalan (1103 or higher).

#### European Studies (15 credit hours)

European Studies core courses (9 credit hours): EUS 2201, 2203, and 4960 (requires thesis)

Social Science (3 credit hours): PSCI 2210, 3211, or appropriate substitute with the approval of the EUS adviser

History (3 credit hours): One course in European history selected from: History 2250, 2260, 2270, 2280, 2290, 2450 or another course in European history in consultation with the EUS adviser

### *Program of Concentration in Spanish, Portuguese, and European Studies*

Students pursuing the interdisciplinary major in Spanish, Portuguese, and European studies combine their focus on Spanish and Portuguese language and literature with a study of modern Europe in its political, economic, and cultural diversity. Students may elect this interdisciplinary major, which requires a minimum of 42 credit hours of course work. A semester of study abroad in Spain is recommended. Course work for the major is distributed as follows:

#### *Spanish (18 credit hours)*

- Spanish language and literature core courses (9 credit hours): Spanish 3301W, 3302, and 3303 (a more advanced composition course may be substituted for 3301W; a more advanced conversation course may be substituted for 3302)
- Spanish culture and civilization (3 credit hours): One of the following: Spanish 3320, 3325, 3360, 3365, 3891
- Spanish literature (3 credit hours): Any Spanish course numbered from 4400–4980 or 3835 or 3893
- Elective (3 credit hours): Any additional Spanish course that counts toward the Spanish major

#### *Portuguese (9 credit hours)*

- Portuguese language and literature courses (6 credit hours): Portuguese 2203 and 3303
- Brazilian culture and civilization (3 credit hours): Portuguese 4350

#### *European Studies (15 credit hours)*

- European Studies core courses (9 credit hours): EUS 2201, 2203, and 4960 (requires thesis)
- Social Science (3 credit hours): PSCI 2210, 3211 or appropriate substitute from any other social studies discipline with approval of the EUS adviser
- History (3 credit hours): One course in European history selected from: History 2250, 2260, 2270, 2280, 2290, 2450 or another course in European history in consultation with the EUS adviser

### *Teacher Licensure*

Candidates for teacher licensure in Spanish at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

### Catalan

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 147.**

### Portuguese

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.*

**Course descriptions begin on page 196.**

### Spanish

Entering students should consult their advisers or the Department of Spanish and Portuguese for advice on placement. Students who have not studied Spanish in high school should begin their studies at Vanderbilt in Spanish 1100. Students with high school Spanish on their records must present a department placement test score in Spanish to be placed correctly. (See department website for more details.) Students with a score of 4 or 5 on the AP Spanish Language or Literature examination should register for Spanish 3301W (Intermediate Spanish Writing).

*Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language. Exception: Students who take Spanish 3301W do not forfeit credit for Spanish 3302.*

**Course descriptions begin on page 205.**

## Teacher Education

STUDENTS interested in preparing for licensure as early childhood, elementary, special education, or secondary school teachers should meet with Associate Dean Roger Moore, College of Arts and Science, as soon as possible to initiate discussion with appropriate personnel in teacher education.

Specific information on program requirements will be found under Licensure for Teaching in the Peabody College section of this catalog.

### *Early Childhood and Elementary Education*

Students interested in preparing to teach early childhood or elementary school pupils major in a single discipline or an interdisciplinary program in the College of Arts and Science as well as in education at Peabody College.

### Secondary Education

The College of Arts and Science and Peabody College offer teacher education programs leading to secondary school teacher licensure in the following fields:

- English
- Mathematics
- Science (Biological Sciences, Chemistry, Earth and Environmental Sciences, Physics)
- Social Studies (History and Political Science). Economics, Psychology, and Sociology may become additional endorsement areas for students who also have selected history or political science as an endorsement area.

Students major in an academic discipline in the College of Arts and Science and complete a second major in education at Peabody College.

### Special Education

Students interested in preparing to teach children with special needs major in special education at Peabody College. Areas of teacher licensure available are mild and moderate disabilities, multiple and severe disabilities, visual impairment, hearing impairment, and early childhood special education.

## Theatre

CHAIR M. Leah Lowe  
 DIRECTOR OF UNDERGRADUATE STUDIES Jon W. Hallquist  
 PROFESSORS EMERITI Robert A. Baldwin, Cecil D. Jones Jr.  
 ASSOCIATE PROFESSORS Phillip N. Franck, Jon W. Hallquist,  
 Terryl W. Hallquist, M. Leah Lowe  
 ASSISTANT PROFESSOR E. Christin Essin  
 SENIOR LECTURERS Alexandra A. Sargent, Matthew D. Stratton  
 WRITERS IN RESIDENCE Diana Grisanti, Stephen Moulds

VANDERBILT'S Department of Theatre offers a vital center of innovative scholarship, teaching, creative expression, and exploration. The study of theatre introduces students to a major form of literature and performing arts, thereby developing a familiarity with one of the greatest cultural heritages and an understanding of human behavior and civilization as it is reflected through the ages. Theatre uniquely shapes perceptions about life into an active experience. Because this process encourages critical thought and discussion, the department provides a singular and important aspect of a liberal arts education through its production season and course work. Viewed as a practical extension of the department's curriculum, plays are produced in Neely Auditorium, a laboratory where students learn to form creative expressions as well as to evaluate and to critique them.

On one level, the Department of Theatre helps the general liberal arts student develop reasoned standards of criticism and an understanding of the intimate correlation between the theatre and the society which it reflects, preparing Vanderbilt graduates for successful careers in theatre as well as other fields of interest. For its majors and minors, the department provides a more detailed and specialized study of the major components of theatrical endeavor, allowing opportunities for the practical application of course work in the productions staged at the theatre. In many cases, the department helps to prepare students with professional aspirations as either artists or teachers in their specialized area of interest.

Work in the productions at Vanderbilt reflects the instruction that occurs in the classroom at Neely Auditorium. Because the academic endeavors require hands-on, project-oriented teaching, students can expect small-to-medium class enrollments and numerous opportunities for exposure to faculty instruction outside of the classroom. The department's curriculum includes courses in acting, directing, design, technology, dramatic literature, theatre history and criticism, and playwriting. Students can either major or minor in theatre at Vanderbilt. The major consists of a minimum of 35 credit hours that include courses in acting, directing, dramatic literature, theatre history/criticism, design, technology, and stagecraft. For the minor, students select one of three more narrowly focused tracks (dramatic literature/theatre history, acting/directing, or design/technology) and complete a minimum of 18 credit hours of course work.

Students may also learn about theatre by studying with Coe Artists, distinguished guest-artist professionals brought to campus each year to benefit majors, minors, and those with a serious interest in theatre. Weeklong master classes are taught by playwrights, actors, designers, and directors from the professional world of theatre, television, and film. Previous Coe Artists have included such celebrated artists as Karl Malden, Olympia Dukakis, Fiona Shaw, Eva Marie Saint, the Living Theatre, and Actors from the London Stage. The Department of Theatre also offers a month-long program of study of theatre in London during the May session. Students have the opportunity to witness a variety of theatrical experiences, as well as hear professional artists speak as guest lecturers.

Theatre majors and minors from Vanderbilt have entered a wide variety of professions and post-graduate opportunities after they graduate. Those seeking employment in the fields of theatre, film, radio, or television have secured positions at appropriate graduate schools or internships with professional companies immediately following their study at Vanderbilt. Many distinguished professional theatre companies across the nation, television networks in New York, and the film industry in Los Angeles include Vanderbilt University Theatre alumni as writers, actors, designers, technicians, dramaturgs, and stage managers. In addition, many Vanderbilt theatre students have secured teaching assignments at either the college/university level (once they have completed appropriate post-graduate education) or the elementary/secondary education level.

The practice of theatre requires individuals to participate through a variety of means: to collaborate with all other members of a production team; to express elements of abstract thought in both oral and written form; and to develop the critical ability to assess and analyze aesthetic choices. As a result of these experiences, recent graduates have also pursued careers in such widely diverse fields as law, medicine, psychology, and business.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### Program of Concentration in Theatre

Students majoring in theatre are required to complete a minimum of 35 credit hours in courses concerned exclusively with theatre and dramatic literature. Required courses are 1010/1010W or 1111, 1711, 1611 2651, and 4961; two courses chosen from 2201, 2202W, 2204, and 4201; one course chosen from 3721, 3761, and 3741; additional 9 credit hours chosen from other theatre courses above the 2000 level.

## Honors Program

The Honors Program in Theatre is designed to afford superior students the opportunity to pursue more intensive work within their major field. Admission requirements are: (1) completion of junior year; (2) completion of at least 21 credit hours of the theatre major; (3) 3.3 minimum cumulative GPA and a 3.5 minimum GPA in courses counting toward the major. Candidates who successfully complete the following requirements may graduate with honors or highest honors: (1) maintain the aforementioned GPA throughout the senior year; (2) complete all requirements of the theatre major; (3) complete 6 credit hours of independent research 4998–4999 (Honors Research and Thesis) normally taken during the senior year; (4) write an honors thesis to be completed by the second semester of the senior year; (5) successfully complete an honors oral examination on the topic of the thesis.

## Minor in Theatre

A minor in theatre requires a minimum of 18 credit hours of courses in the department. All students minoring in theatre must complete 1010/1010W or 1111 and 4201. In addition, each student must complete one of the following three clusters: Dramatic Literature/Theatre History: 2201, 2202W, 2204, and 3201W; Acting/Directing: 1611, 3611, 4611, and 2651; Design/Technology: 1711 is required; choose three from 3721, 3761, 3741, or 3781.

Course descriptions begin on page 208.

# Women's and Gender Studies

DIRECTOR Katherine B. Crawford  
 ASSOCIATE DIRECTOR Melanie Adley  
 DIRECTOR OF UNDERGRADUATE STUDIES Melanie Adley  
 PROFESSOR EMERITA Charlotte Pierce-Baker  
 PROFESSORS Dana Nelson, Kelly Oliver  
 PRINCIPAL SENIOR LECTURER Julia A. Fesmire (Women's and Gender Studies, English)  
 SENIOR LECTURERS Melanie Adley, Stacy Simpican  
 LECTURER Jamie Shenton (Women's and Gender Studies)

## Affiliated Faculty

PROFESSORS Houston A. Baker (English), Robert F. Company (Asian Studies), Ellen W. Clayton (Pediatrics, Law), Katherine B. Crawford (History), Cynthia J. Cyrus (Blair), Colin Dayan (English), Bonnie J. Dow (Communication Studies), Lynn E. Enterline (English), Earl E. Fitz (Portuguese), Vivien G. Fryd (History of Art), Tracey E. George (Law), Barbara Hahn (German), Joni L. Hersch (Law), Cathy L. Jrade (Spanish), Vera M. Kutzinski (English), Amy-Jill Levine (New Testament Studies), Leah S. Marcus (English), Jonathan M. Metz (Medicine, Health, and Society), Holly J. McCammon (Sociology), Thomas A. McGinn (History), José M. Medina (Philosophy), Bonnie J. Miller-McLemore (Religion, Psychology, and Culture), Mark L. Schoenfield (English), Kathryn Schwarz (English), Virginia M. Scott (French and Italian), Laurel C. Schneider (Religious Studies), Tracy D. Sharpley-Whiting (African American and Diaspora Studies, French), John M. Sloop (Communication Studies), Hortense J. Spillers (English), Cecelia Tichi (English), Benigno L. Trigo (Spanish and Portuguese), Arleen M. Tuchman (History), Holly A. Tucker (French and Italian)

ASSOCIATE PROFESSORS Brooke A. Ackerly (Political Science), Ellen T. Armour (Theology), Vanessa B. Beasley (Communication Studies), Laura M. Carpenter (Sociology), Beth A. Conklin (Anthropology), Nathalie A. Debrauwere-Miller (French and Italian), Idit Dobbs-Weinstein (Philosophy), Jennifer Fay (Cinema and Media Arts), James C. Fraser (Human and Organizational Development), Kathy L. Gaca (Classical Studies), Teresa A. Goddu (English), Derek M. Griffith (Medicine, Health, and Society), Lisa Guenther (Philosophy), Eva M. Harth (Chemistry), Sarah E. Igo (History), Christina Karageorgou-Bastea (Spanish and Portuguese), Shaul J. Kelner (Sociology, Jewish Studies), Claire S. King (Communication Studies), Melanie D. Lowe (Blair), Richard J. McGregor (Religious Studies), Adam S. Meyer (Jewish Studies), Catherine A. Molineux (History), Ifeoma C. Nwankwo (English), Emanuelle Oliveira-Monte (Spanish and Portuguese), Bridget E. Orr (English), Richard N. Pitt (Sociology), Lynn T. Ramey (French), Nancy B. Reisman (English), Ruth Rogaski (History), Allison H. Schachter (Jewish Studies), C. Melissa Snarr (Ethics and Society), Meike G. Werner (German and Slavic Languages), Edward N. Wright-Rios (History)

ASSISTANT PROFESSORS Candice Amich (English), Christin Essin (Theatre), Aimi Hamraie (Medicine, Health, and Society), Rolanda L. Johnson (Nursing), Mireille M. Lee (History of Art), Linda G. Manning (Psychiatry), N. Michelle Murray (Spanish and Portuguese)

SENIOR LECTURERS Yollette T. Jones (History), Elizabeth S. Meadows (English), Courtney S. Muse (Medicine, Health, and Society), Elena Olazagasti-Segovia (Spanish), Alexandra A. Sargent (Theatre)

LECTURERS Sophie Bjork-James (Anthropology), Elizabeth R. Covington (English), Jeremy DeWaal (History), Amanda M. Kinard (English), Nancy M. Roche (English), Terrie Spetalnick (Sociology)

WRITER IN RESIDENCE Alice Randall (African American and Diaspora Studies)

WOMEN'S and Gender Studies is an interdisciplinary program that examines gender as a social construct and as a historically variable component of culture that orders human behavior, perceptions, and values. The program teaches its students to reexamine traditional beliefs, to engage in new kinds of research, and to bring a critical perspective to the everyday practices that shape women's and men's lives in the United States and globally. Our courses and instructors pay particular attention to the consequences for women, men, and children of living in a world characterized by profound inequalities. The program also recognizes that race, class, ethnicity, age, sexuality, ability, and nationality are crucial aspects of identity and experience; these are understood to be intersecting and contested features of social life and are examined as such.

Because these aforementioned features of human experience cut across many disciplines, students in the Program in Women's and Gender Studies achieve a deeper understanding of the complexity and wholeness of human life. In the classroom, as in faculty and student research, our goal is to transform traditional ways of knowing by reaching across epistemological and methodological divisions to foster comprehensive, interdisciplinary perspectives on gender, sexuality, identity, and power in social life. Women's and gender studies not only compels us to recognize the problems and possibilities of the changing times in which we live, but also empowers us to effect change.

The Women's and Gender Studies program offers a major and a minor which provide an excellent foundation for students who plan to enter professional schools in law, medicine, and business; for those who pursue advanced degrees in women's and gender studies, the humanities, and social sciences; as well as for those who move into careers in business, government, research, teaching, health and social administration, counseling, journalism, advocacy, and the media.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

### *Program of Concentration in Women's and Gender Studies*

The interdisciplinary major in women's and gender studies consists of 36 credit hours of course work, distributed as follows:

1. *Core courses.* Either 1150 (or 1150W) or 1160, 3201, and either 3246W or 3250 (or 3250W). (9 credit hours)
2. *Senior Seminar.* 4960. Generally taken in the second semester of the student's final year. (3 credit hours)
3. *24 credit hours of electives.* Any courses in the Women's and Gender Studies program; any courses dual-listed in Women's and Gender Studies; any course that meets the approval of the director of undergraduate studies and is not used to satisfy the above requirements. These elective courses may include up to 6 credit hours of internship and/or independent research (3882, 3883).

### *Honors Program*

The Honors Program in Women's and Gender Studies requires 36 credit hours of course work and is designed to afford exceptional students the opportunity to undertake independent research on a topic in feminist and/or gender scholarship in consultation with faculty members. The program is open to all women's and gender studies majors with junior standing who have completed at least 24 credit hours of the major and who have earned a 3.3 cumulative grade point average and a 3.3 grade point average in courses counting toward the women's and gender studies major. Students must be approved for acceptance into the Honors Program by the program director. To graduate with honors in women's and gender studies, students must:

- (a) Complete 36 credit hours of course work;
- (b) Complete the required courses for the major (described above);
- (c) Submit for approval a short description of the Honors project/thesis to the director of the Women's and Gender Studies program, no later than second semester of the junior year;
- (d) Complete 6 credit hours of independent research, 4998 and 4999 (Honors Research and Project), typically during the senior year under supervision of the project adviser. These 6 credit hours count as electives in the 36 credit hours of course work for Honors majors.
- (e) Complete an honors project by the second semester of the senior year; and
- (f) Pass an oral examination on the topic of the Honors project/thesis.

Candidates for honors in women's and gender studies may, with the written permission of the director of the program, substitute one 3000-level course in gender and/or feminist studies for one 2000-level course required for the major.

Information concerning the Honors Program is available from the director of the Women's and Gender Studies program. College regulations governing honors may be found in this catalog under Honors Programs.

### *Minor in Women's and Gender Studies*

The minor in women's and gender studies consists of 18 credit hours of course work, distributed as follows:

1. *Core courses.* Either 1150 (or 1150W) or 1160, 3201, and either 3246W or 3250 (or 3250W). (9 credit hours)
2. *Senior Seminar.* 4960. Generally taken in the second semester of the student's final year. (3 credit hours)
3. *At least 6 credit hours of electives.* Any courses in the Women's and Gender Studies program; any courses dual-listed in Women's and Gender Studies; any course that meets the approval of the director of undergraduate studies, and is not used to satisfy the above requirements.

*Recommended courses organized by subject area are as follows.*

*\*Note:* 1111 First-Year Writing Seminars and Special Topics courses vary each semester. For full descriptions of current seminar offerings and information on whether a particular First-Year Writing Seminar can be used to fulfill requirements for the women's and gender studies major or minor, consult the program director.

AFRICAN AMERICAN AND DIASPORA STUDIES: 1111, First-Year Writing Seminar\*; 1204, Diaspora Feminisms; 2204, Politics of Beauty and Blacks; 3214, Black Masculinity: Social Imagery and Public Policy; 4264, Black Diaspora Women Writers.

ANTHROPOLOGY: 2105, Race in the Americas; 3121, Global Wealth and Poverty; 2342, Biology of Inequality; 2110, Gender and Cultural Politics.

CLASSICAL STUDIES: 1111, First-Year Writing Seminar\*; 3100, Women, Sexuality, and the Family in Ancient Greece and Rome.

COMMUNICATION STUDIES: 1111, First-Year Writing Seminar\*; 2950, Rhetoric of Mass Media; 3100, Rhetoric of Social Movements; 3110, Women, Rhetoric, and Social Change; 3720, Communicating Gender; 3890, Selected Topics in Communication Studies\*.

DIVINITY: 7123, Ethics and Society: Justice.

ENGLISH: 1111, First-Year Writing Seminar\*; 1230W, Literature and Analytical Thinking\*; 1260W, Introduction to Literary and Cultural Analysis\*; 3622, Nineteenth-Century American Women Writers; 3670, 3670W, Colonial and Post-Colonial Literature\*; 3674, Caribbean Literature; 3742, Feminist Theory; 3890, 3890W, Movements in Literature\*; 3894, 3894W, Major Figures in Literature\*; 3898, 3898W, Special Topics in English and American Literature\*.

FRENCH: 3230, French and Francophone Cinema; 4320, French Feminist Thought: Literary and Critical; 4322, Adultery and Transgressions in Literature.

GERMAN: 2444, German Fairy Tales: From Brothers Grimm to Walt Disney; 3344, Women at the Margins: German-Jewish Writers; 4535, German Romanticism; 4537, Women and Modernity.

HISTORY: 1111, First-Year Writing Seminar\*; 2810, Women, Health, and Sexuality; 2835, Sexuality and Gender in the Western Tradition to 1700; 2840, Sexuality and Gender in the Western Tradition since 1700; 3010, Pornography and Prostitution in History; 4960, Majors Seminar\*.

HISTORY OF ART: 2765, Art since 1945; 3228W, Gender and Sexuality in Greek Art; 3840, Directed Study\*; 4960, Advanced Seminar\*.

ITALIAN: 3340, *Famous Women* by Boccaccio.

JEWISH STUDIES: 1111, First-Year Writing Seminar\*.

LATINO AND LATINA STUDIES: 2101, Introduction to Latino and Latina Studies.

MEDICINE, HEALTH, AND SOCIETY: 1111, First-Year Writing Seminar\*; 1930, Health Social Movements; 1940, Racial and Ethnic Health Disparities; 2230, Masculinity and Men's Health; 2240, Bionic Bodies, Disability Cultures; 2250, War and the Body; 3890, Special Topics\*.

PHILOSOPHY: 3604, Gender and Sexuality; 3007, French Feminism.

POLITICAL SCIENCE: 2209, Issues in Political Theory; 2236, The Politics of Global Inequality; 3264W, Global Feminisms; 3271, Feminist Theory and Research; 3893, Selected Topics in American Government\*.

PSYCHOLOGY: 3705, Human Sexuality.

RELIGIOUS STUDIES: 1111, First-Year Writing Seminar; 1820, Religion, Sexuality, and Power; 3225, Sexuality in the Hebrew Bible and the Ancient Near East; 3926, Ancient Goddesses; 3930, Women and Religion; 4554, The Qur'an and Its Interpreters; 4834, Post-Freudian Theories and Religion; 4938, Marriage in the Ancient Near East and the Hebrew Bible.

RUSSIAN: 1874, Russian Fairy Tales.

SOCIOLOGY: 3221, The Family; 3304, Race, Gender, and Health; 3603, Women and Social Activism; 3604, American Social Movements; 3611, Women and the Law; 3616, Women and Public Policy in America; 3702, Racial and Ethnic Minorities in the United States; 3704, Race, Gender, and Sport; 3711, Women, Gender, and Globalization; 3722, Gender in Society; 3723, Gender, Sexuality, and the Body; 3724, Gender Identities, Interactions, and Relationships.

SPANISH: 3893, Special Topics in Hispanic Literature\*; 4755, Latin and Latin American Women Writers.

THEATRE: 2781, The History of Fashion: Sex and Propaganda; 3741, Elements of Basic Design: Costuming and Makeup.

**Course descriptions begin on page 210.**

# College of Arts and Science Courses

## Explanation of Course Numbers and Symbols

**1000-level courses** are introductory courses primarily taken by freshmen and sophomores.

**2000- and higher-level courses** are intermediate- or advanced-level courses which typically require some prerequisite. They are primarily intended for sophomores, juniors, and seniors.

**Hours** are semester hours—e.g., a three-hour course carries credit of three semester hours.

**Bracketed figures** indicate semester hours credit, e.g., [3].

**First-Year Writing Seminars** are numbered 1111.

**W symbols** used in course numbers designate courses in the College of Arts and Science that will meet the AXLE writing requirement.

**The AXLE designation** in parentheses in each course description indicates which AXLE requirement pertains. For example, (HCA) indicates credit for Humanities and the Creative Arts in AXLE. The designation (No AXLE credit) indicates the course does not satisfy an AXLE degree requirement.

The university reserves the right to change the arrangement or content of courses, to change the texts and other materials used, or to cancel any course on the basis of insufficient enrollment or for any other reason.

It is the responsibility of each student to avoid duplication, in whole or in part, of the content of any courses offered toward the degree. Such duplication may result in withdrawal of credit.

## African American and Diaspora Studies

**AADS 1001. Commons Seminar.** [Formerly AADS 99] Topics vary. Open only to first-year students. General Elective credit only. [1] (No AXLE Credit)

**AADS 1010. Introduction to African American and Diaspora Studies.** [Formerly AADS 101] Foundations of African American culture from ancient African history and through contemporary issues in the African American experience and the larger diaspora. The characteristics, developments, and dynamics of diaspora culture in the Americas, with a particular focus on the United States. [3] (P)

**AADS 1016. Race Matters.** [Formerly AADS 110] Race and racism in the United States and their impact on democratic practices. General intellectual and cultural manifestations of the significance of race and how it influences democratic reform: racial preferences, the prison industrial complex, national security, HIV/AIDS, and elections. [3] (US)

**AADS 1111. First-Year Writing Seminar.** [Formerly AADS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**AADS 1204. Diaspora Feminisms.** [Formerly AADS 120] Introduction to feminism in multiple diasporic places and communities. Comparison of black feminisms across time and space. [3] (INT)

**AADS 1506. Reel to Real: Film Aesthetics and Representation.** [Formerly AADS 150] Oppositional cinematic practices of black filmmakers. Hollywood representations of blacks. The theoretical language of film criticism, styles, genres, periods. [3] (P)

**AADS 1706. Capoeira: Afro-Brazilian Race, Culture, and Expression.** [Formerly AADS 170] Origins of an Afro-Brazilian martial art form. Influence on Brazilian and world culture in the areas of religion, dance, and music. Development as a social protest movement. Intersections of race, gender, class, power, and national identity. [3] (INT)

**AADS 2104. Popular Culture and Black Sexual Politics.** [Formerly AADS 200] Constructed images of black masculinity, femininity, and sexuality in popular culture. Social political hierarchies in society at-large. [3] (HCA)

**AADS 2106. African Diaspora: A Problem for Thought.** [Formerly AADS 102] Beginning with the slave trade in Europe to the formation of slave colonies in the Americas. Meaning of diaspora for African subjects in the 18th-19th centuries, and challenges to racism and colonialism in the African Diaspora in the 20th century. [3] (P)

**AADS 2148. Blacks in Latin America and the Caribbean.** [Formerly AADS 140] Distinctive cultural forms and patterns in the Caribbean basin and Latin America from the sixteenth century to the present. Diverse origins of culture. Slave society's impact on cultural production. [3] (INT)

**AADS 2166. African American Influences on Country Music.** African and African American aesthetics, instruments, and people. Southern rural folk music in the United States. [3] (US)

**AADS 2168. Black Migrations in the African Diaspora.** [Formerly AADS 160] The impact of migration in a post-civil rights and post-colonial world. Political tensions, identity politics, and solidarity. Comparative anthropological and sociological narratives on race, culture, and ethnicity. Countries and regions include Democratic Republic of Congo, France, Ghana, Liberia, Tanzania, parts of Asia, and the U.S. [3] (INT)

**AADS 2178. Global Africa.** [Formerly AADS 165] The globalization of Africa within the context of Arab and European expansion. Historical flash-points and contemporary events. The invention of Africa in literary and political discourses. The geopolitics of aid and development. Africa's relationship with the African diaspora, including modern migrations and debates on the racial and geographic divide between Arab regions north and south of the Sahara. [3] (INT)

**AADS 2204. Black Women and the Politics of Blackness and Beauty.** [Formerly AADS 207] Competing and contested meanings of beauty and race in the post-black society. The role of traditional and new media in self-expressions and self-understandings of color, body image, hair, and relationships. [3] (HCA)

**AADS 2214. History and Myth: Black Women in the United States.** [Formerly AADS 221] Complexities of being black and female in the history of the United States. Interrogation of racism, class, sexuality, and sexism. Black women's multifaceted, diverse community roles. [3] (HCA)

**AADS 2294. Black Paris - Paris Noir: The African Diaspora and the City of Light.** [Formerly AADS 209] The lived experiences, tensions, belonging, and representations of people of African descent who self-identify and are identified as Black or Noir in Paris, France, from the interwar years to the present. Diversity, intergroup relations, and race beyond the United States. No credit for students who have earned credit for 1111 section 5. [3] (INT)

**AADS 2306. Race, Mixed Race, and "Passing."** [Formerly AADS 230] Social, legal constructions and live experiences of race. Phenomenon of "passing" and category of "mixed race" in fiction, film, and landmark court cases. [3] (HCA)

**AADS 2356. African Spirits in Exile: Diaspora Religions in the Americas.** Use of anthropology, folklore, history, and literature to examine the history of Haitian Vodun, Cuban Santería, Brazilian Candomblé, New Orleans Voodoo, and Trinidadian Orisha worship. Comparisons with Black Christian traditions and supernatural beliefs beyond organized religion. [3] (P)



**AADS 2654. Memoirs and Biographies.** [Formerly AADS 265] Biographies and autobiographies as lenses for the study of historical trends and events; development of gender, sexual, and racial identities in subjects. [3] (US)

**AADS 2694. African Diaspora Ethnography.** [Formerly AADS 269] Anthropology and the construction of race and blackness. Ethnography as method. Notions of roots and routes in the making of African diaspora culture. [3] (INT)

**AADS 3104W. Soul Food as Text in Text: An Examination of African American Foodways.** [Formerly AADS 208W] Distinctions between Southern food and soul food. Soul food as performance and projection of gender and racial identity. Cookbooks as literary artifacts. Soul food in American popular culture, and in African American, Southern, and women's writing. Soul food and community formation. Serves as repeat credit for students who have completed 265W and for students who completed ENGL 288W in fall 2010. [3] (HCA)

**AADS 3178. Colonialism and After.** [Formerly AADS 220] African and Caribbean cultures of colonialism. Forms of decolonization and the predicament of neocolonialism from the emergence of capitalism to the present. The historical and anthropological projects of empire and race-making. Causes and strategies of expansion. Forms of representation and knowledge production. Discourses around intimacy, illness and hygiene. Practices of coercion and violence. [3] (INT)

**AADS 3204W. African American Children's Literature.** [Formerly AADS 204W] From the seventeenth century to the present. Oral and written; fiction and non-fiction. Major works, writers, and genres. No credit for students who earned credit for 294a section 1 in spring 2011. [3] (HCA)

**AADS 3206. Mystery, Murder, and Mayhem in Black Detective Fiction.** [Formerly AADS 202] Detective fiction in America, beginning with Edgar Allan Poe, the founder of the genre in the American literary tradition, and continuing on with such black writers as Chester Himes, Walter Mosley, Paula Wood, and Pamela Thomas-Graham. [3] (HCA)

**AADS 3208W. Blacks in the Military.** [Formerly AADS 203W] Black participation in American and other wars, from the Revolutionary and Civil wars to ongoing global conflicts. Issues of democracy and freedom. Thematic explorations through film. [3] (P)

**AADS 3214. Black Masculinity: Social Imagery and Public Policy.** [Formerly AADS 210] Historical and contemporary debates, perceptions, and attitudes. Public policy debates surrounding disparate incarceration rates and sentencing, policing, racial imagery, "down low" homosexuality, criminality, hypersexuality, and athleticism. [3] (SBS)

**AADS 3248. Atlantic African Slave Trade.** [Formerly AADS 145] Cultural, economic, and social aspects of the African slave trade into the Americas from the 16th to 19th centuries. Transformation of the slave trade as a result of abolition and suppression. [3] (SBS)

**AADS 3258. Black Issues in Education.** [Formerly AADS 215] Race, ethnicity, gender, class and their relationships to both the broader roles of schooling and education in American society. Historical foundation of education for African Americans, educational and socioeconomic inequality, family structures, and social policy initiatives. [3] (SBS)

**AADS 3278. Black Europe.** [Formerly AADS 275] History and politics of the African Diaspora in Europe. Focus on Britain, France, Germany, the Netherlands, and Scandinavia. European Union debates about social exclusion; race in the European context. [3] (INT)

**AADS 3850. Independent Study.** [Formerly AADS 289] May be repeated for a total of 6 credits, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of AADS 3850] (No AXLE credit)

**AADS 3880. Internship Training.** [Formerly AADS 280B] Graded on a Pass/Fail basis only and must be taken concurrently with 3881. These hours may not be included in the minimum number of hours required for the African American and Diaspora studies major. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private institutions on issues relative to the black experience. A minimum of 3 hours of background reading and research will be com-

pleted in AADS 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in AADS, and prior approval by the director of Undergraduate Studies in African American and Diaspora Studies of the student's plan are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

**AADS 3881. Internship Readings and Research.** [Formerly AADS 280A] Readings conducted under the supervision of a member of the African American and Diaspora Studies program and a substantial research paper are required. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private institutions on issues relative to the black experience. A minimum of 3 hours of background reading and research will be completed in AADS 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in AADS, and prior approval by the director of Undergraduate Studies in African American and Diaspora Studies of the student's plan are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3880. [Variable credit: 3-6] (No AXLE credit)

**AADS 3890. Special Topics.** [Formerly AADS 294A] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**AADS 4198. Global Anti-Blackness and Black Power.** [Formerly AADS 190] The relationship and relevance of Black Power to anti-blackness in the United States and globally. The systemic marginalization and exclusion of blacks in public life. Their resilience against and resistance to those efforts. [3] (INT)

**AADS 4256. Haiti: Freedom and Democracy.** [Formerly AADS 205] The Saint-Domingue Revolution from 1791 to 1803 and the development of Haiti from 1804 to the present. Haiti in global context; the revolution as a key moment in the Age of Revolution and the formation of the Black International. Historical monographs, novels, poetry, visual culture, and music. [3] (INT)

**AADS 4264. Black Diaspora Women Writers.** [Formerly AADS 260] Comparative fiction by women from Francophone and Anglophone Africa, the Caribbean, and the United States. Novels of awakening (bildungsgroman), themes of exile, home and alienation, identity as well as sexuality, class and color, slavery and colonialism. [3] (HCA)

**AADS 4270. Research Methods.** [Formerly AADS 270] Collection, management, analysis and interpretation of data for research. Introduction to qualitative computer software programs. [3] (SBS)

**AADS 4979. Senior Thesis in African American and Diaspora Studies.** [Formerly AADS 299] Senior Thesis in African American and Diaspora Studies. Supervised readings and independent research to produce an interdisciplinary research paper; topic to be selected in conjunction with a faculty member of African American and Diaspora Studies. Open only to seniors. [3] (No AXLE credit)

**AADS 4999. Senior Honors Thesis.** [Formerly AADS 298] Supervised readings and independent research for honors thesis under supervision of the adviser and another faculty member. Open only to seniors in the Honors Program. [3] (No AXLE credit)

## American Studies

**AMER 1001. Commons Seminar.** [Formerly AMER 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

**AMER 1002. Introduction to American Studies.** [Formerly AMER 100] An interdisciplinary approach to American culture, character, and life. Repeat credit for students who have completed 1002W. [3] (US)

**AMER 1002W. Introduction to American Studies.** [Formerly AMER 100W] An interdisciplinary approach to American culture, character, and life. Repeat credit for students who have completed 1002. [3] (US)

**AMER 1111. First-Year Writing Seminar.** [Formerly AMER 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**AMER 1200. Introduction to Southern Studies.** [Formerly AMER 101] An interdisciplinary approach to southern American culture, character, and life approached from the interrelated perspectives of history and culture (literature, music, religion, images, rituals, material culture). [3] (US)

**AMER 3200. Global Perspectives on the U.S.** [Formerly AMER 202] Contemporary and historical views of the U.S. political and cultural presence in the world; comparative nationalisms; emphasis on points of view outside the U.S. [3] (US)

**AMER 3830. Serving and Learning.** [Formerly AMER 201] Meanings of and motives behind community service in the United States. The process of engagement in meaningful service. Challenges in integrating service with academic coursework. A service-learning course. [3] (P)

**AMER 3851. Independent Readings and Research.** [Formerly AMER 289A] Independent readings and/or research on approved topics relating to American society and culture. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of AMER 3851 and 3852] (No AXLE credit)

**AMER 3852. Independent Readings and Research.** [Formerly AMER 289B] Independent readings and/or research on approved topics relating to American society and culture. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of AMER 3851 and 3852] (No AXLE credit)

**AMER 3880. Internship Training.** [Formerly AMER 280B] Offered on a pass/fail basis only and must be taken concurrently with 3881. Under faculty supervision, students intern in public or private organizations, conduct background research and reading, and submit a research paper at the end of the semester during which the internship training is complete. Background reading and research will be completed in 3881 concurrently with the completion of internship training, 3880; a minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Corequisite: 3881. [Variable credit: 1-6] (No AXLE credit)

**AMER 3881. Internship Readings and Research.** [Formerly AMER 280A] Under faculty supervision, students intern in public or private organizations, conduct background research and reading, and submit a research paper at the end of the semester during which the internship training is completed. Background reading and research will be completed in 3881 concurrently with the completion of internship training, 3880; a minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Corequisite: 3880. [3-6]. (No AXLE credit)

**AMER 3890. Topics in American Studies.** [Formerly AMER 240] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (SBS)

**AMER 4000. The American Studies Workshop.** [Formerly AMER 294] Issues, methodologies, traditions, approaches, and problems in the discipline. Limited to juniors and seniors with preference given to majors and minors. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**AMER 4100. Undergraduate Seminar in American Studies.** [Formerly AMER 295] Advanced reading, research, and writing in a particular area of American Studies. Limited to juniors and seniors with preference given to American Studies majors. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this

course each semester. [3; maximum of 6 credits total for all semesters of AMER 4100] (SBS)

**AMER 4960. Senior Project.** [Formerly AMER 297] A project conceived, developed, and completed under supervision of the American Studies faculty. Normally open only to senior American Studies majors. [3] (SBS)

**AMER 4998. Senior Honors Research.** [Formerly AMER 298] Acquisition, reading, and analysis of primary source research material. Open only to senior honors students. [3] (No AXLE credit)

**AMER 4999. Senior Honors Thesis.** [Formerly AMER 299] Writing an honors thesis under the supervision of the thesis adviser. [3] (No AXLE credit)

## Anthropology

**ANTH 1001. Commons Seminar.** [Formerly ANTH 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ANTH 1101. Introduction to Anthropology.** [Formerly ANTH 101] The study of diverse cultures in the contemporary world. The ways in which cultures have developed and changed. Intended for students with a general interest in the field of anthropology. [3] (SBS)

**ANTH 1111. First-Year Writing Seminar.** [Formerly ANTH 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**ANTH 1201. Introduction to Archaeology.** [Formerly ANTH 104] Archaeological interpretation of global human history from early settled villages through the rise of the first civilizations. Archaeological methods and analysis, interpretive controversies, and cultural heritage. Environment, technology, religion, and human diversity in past cultural transformations. Rise of early cities and states. Repeat credit for students who earned credit for 1201W. [3] (SBS)

**ANTH 1201W. Introduction to Archaeology.** Archaeological interpretation of global human history from early settled villages through the rise of the first civilizations. Archaeological methods and analysis, interpretive controversies, and cultural heritage. Environment, technology, religion, and human diversity in past cultural transformations. Rise of early cities and states. Repeat credit for students who earned credit for 1201. [3] (SBS)

**ANTH 1301. Introduction to Biological Anthropology.** [Formerly ANTH 103] Natural selection and evolution of primates and humans. Theories on early human lifeways and behavior. Bioarchaeological and bioanthropological studies of past and present human health and disease. Evaluation of fossil, skeletal, molecular, and artifactual evidence in reconstructing the past. [3] (MNS)

**ANTH 1601. Introduction to Language and Culture.** [Formerly ANTH 105] The interrelationship between language and culture. Language and thought, language ideologies, discourse, and linguistic and social identities. Culture and language change. [3] (SBS)

**ANTH 2105. Race in the Americas.** [Formerly ANTH 205] Origins of the concept of race. Comparison of past and present racial ideologies and practices in the United States, Latin America, and the Caribbean. The intersection of race with gender, ethnicity, class, nationalism, and colonialism. [3] (P)

**ANTH 2106. Culture and Power in Latin America.** [Formerly ANTH 210] Survey of native cultures and Spanish and Portuguese heritage. Fundamental traditions, including marriage and the family, the relationship between men and women, racial and ethnic identity, social class, and religion. Peasant communities and contemporary urban life. [3] (INT)

**ANTH 2108. Indigenous Peoples of Lowland South America.** [Formerly ANTH 249] Native societies of Amazonia, the Orinoco basin, and

other forest, savanna, and coastal regions of South America. Ecology, cosmology, social organization, and political relations in historical and contemporary populations. Government policies, human rights, environmentalism, sustainable development, and indigenous activism and advocacy. [3] (SBS)

**ANTH 2109. Food Politics in America.** [Formerly ANTH 208] The cultural, social, political, and economic contexts of the contemporary food system. Issues of health and nutrition. Land use, ecological relations, food chains, and links to climate change. Ethics of food production, distribution, and consumption. Agricultural policy, immigration, work conditions, animal welfare, and local economies. Roles of citizens and consumers. Rise of movements seeking sustainable alternatives. [3] (US)

**ANTH 2110. Gender and Cultural Politics.** [Formerly ANTH 266] Cross-cultural comparison of women's roles and status in western and non-Western societies. Role of myths, symbols, and rituals in the formation of gender identities and the politics of sexual cooperation, conflict, and inequality. Case studies from Africa, the Middle East, Europe, North and South America, Asia, and Melanesia. [3] (P)

**ANTH 2113W. Food, Identity, and Culture.** Food in Western and non-Western cultures. Food, power, and the making of social beings. Taboos, cultural preferences, and sensory perceptions. Role of eating in social categories, boundaries, and the creation of self and other. Food fashion, globalization, and food in the media. [3] (INT)

**ANTH 2211. Archaeology.** [Formerly ANTH 211] An introduction to the methods used by archaeologists to study the nature and development of prehistoric societies. Approaches to survey, excavation, analysis, and interpretation are explored through lectures, case studies, and problem assignments. [3] (SBS)

**ANTH 2214. Art and Architecture in the Ancient Americas.** [Formerly ANTH 257] Visual arts and built environments in Mesoamerican and South American civilizations before European contact. Sacred, cultural, and historical influences on building traditions and iconography. [3] (INT)

**ANTH 2220. Human Landscapes.** [Formerly ANTH 282] Human-environment interactions in the formation of landscapes and settlement systems. Uses of archaeology, cultural anthropology, and cross-cultural comparison to understand social space, sacred landscapes, urban plans, and historical ecology. Methods of interpretation through quantitative, social, and symbolic analysis. Repeat credit for students who earned credit for 2220W. [3] (SBS)

**ANTH 2220W. Human Landscapes.** Human-environment interactions in the formation of landscapes and settlement systems. Uses of archaeology, cultural anthropology, and cross-cultural comparison to understand social space, sacred landscapes, urban plans, and historical ecology. Methods of interpretation through quantitative, social, and symbolic analysis. Repeat credit for students who earned credit for 2220. [3] (SBS)

**ANTH 2221. Old World Archaeology.** [Formerly ANTH 217] Ancient Cultures of the Old World. Archaeology of the Near East, Africa, Asia, and Oceania. The origins of the great civilizations of Egypt and Mesopotamia. The beginnings of cities, agriculture, trade, and empires in light of recent archaeological discoveries. [3] (INT)

**ANTH 2227. Food in the Ancient World.** Development of agriculture from around 8,000 BCE to the contact between Old and New Worlds in 1492. Role of foodways in human societies and impact on historical and environmental change. Integration of foodways with social and cultural systems such as gender, identity, ideology, and trade. Elements of historical cuisines, including cooking techniques, meat, and alcohol. Excursions to local sites of agricultural, archaeological, and food-related relevance. [3] (SBS)

**ANTH 2230. South American Archaeology.** [Formerly ANTH 252] From 12,000 years ago to the present. Archaeology, ethnohistory, and ethnography. [3] (SBS)

**ANTH 2231. Ancient Andean Civilizations.** [Formerly ANTH 248] Introduction to the archaeology and peoples of ancient South America. Early hunters and gatherers, origins of agriculture and urbanism, and the rise and fall of the Huari and Inca empires. [3] (INT)

**ANTH 2242. The Archaeology of the Ancient Maya Civilization.** [Formerly ANTH 213] Case study in cultural evolution. Archaeological evidence and social theory on the enigmatic origins, complex nature, and sudden collapse of the ancient Maya civilization. [3] (INT)

**ANTH 2250. Contemporary Middle East and Kurdistan.** From Ottoman and Safavid empires to Syria, Turkey, Iran, and Iraq. Kurds, Kurdish history, and the Middle East. Nationalism, Kurdish ethnicity, and uprisings; Kurdish politics across four nation-states. Kurdish community in Nashville. [3] (INT)

**ANTH 2342. Biology of Inequality.** [Formerly ANTH 242] Biological and health consequences of racial and social inequalities. Psychosocial stress and measurement of its health impact. Effects on disease and precursors to disease. Measures of molecular biology, such as epigenetics and gene expression. Biomarkers of inflammation, cardiometabolic health, and immune function. [3] (SBS)

**ANTH 2370. Death and the Body.** [Formerly ANTH 267] Cross-cultural study of death rituals. Mortuary archaeology and anthropology of death and the body. Biological and social perspectives on the corpse and living body, and their treatment in ritual and everyday life. The body as biological specimen and social artifact. Nature of beauty, body modification, and adornment. [3] (SBS)

**ANTH 2601. Introduction to Linguistics.** [Formerly ANTH 201] Systematic study and analysis of human language. Formation of language sounds, sound systems, the structure of words, the structure of sentences, meaning, language change. Data from diverse languages of the world. [3] (SBS)

**ANTH 2602. Anthropological Linguistics.** [Formerly ANTH 203] An introduction to the study of language in its anthropological context. Language and culture, the structure of symbolic systems, vocabulary as a guide to the ways societies classify their universe. Linguistic analysis as a tool for ethno-graphic investigation. [3] (SBS)

**ANTH 2603. Comparative Writing Systems.** [Formerly ANTH 219] The origins, development, and social uses of writing in the ancient Middle East, Mediterranean, and Mesoamerica. Decipherments of hieroglyphic systems. Literacy, historiography, and cross-cultural translation. [3] (HCA)

**ANTH 3120. Sociocultural Field Methods.** [Formerly ANTH 275] Research design and proposal writing, access to data, ethical issues, sampling techniques, interviewing questionnaire design and question writing, data analysis. [3] (SBS)

**ANTH 3121. Global Wealth and Poverty.** [Formerly ANTH 209] The production of inequality. How wealth is accumulated, lost, exchanged, and displayed; how poverty is created, endured, and overcome. Explanations in terms of luck, hard work, immorality, occult forces, and public policies. Case studies. [3] (P)

**ANTH 3122. The Anthropology of Globalization.** [Formerly ANTH 232] Perspectives on globalization based on ethnographic case studies. The impact of new technologies on native cultures; different cultural meanings of global commodities; creation of new diaspora cultures; effects of neoliberal reforms on local economies; ethnic movements and terror networks. [3] (INT)

**ANTH 3130. Andean Culture and Society.** [Formerly ANTH 246] Historical and archaeological background, languages, economy, environment, and cultural adaptation of Andean peoples. Spanish and native American heritage. Religion, family structure, political organization, contemporary social issues, and economic background. Urban and rural traditions, social movements, and change. [3] (SBS)

**ANTH 3132. Social Movements.** [Formerly ANTH 225] Collective action, past and present. Class- and identity-based movements, transnational activism, and networks. The early U.S. labor movement; 1960s gay, women's and civil rights movements. Global struggles for social justice. [3] (INT)

**ANTH 3133. Political Anthropology.** [Formerly ANTH 224] Comparative and ethnographic analysis of political and legal systems. Formal and informal means of control in egalitarian and hierarchical societies. Anthropological theories of power, authority, influence, and leadership. Social and cultural dimensions of conflict, consensus, competition, and dispute resolution. [3] (SBS)

**ANTH 3134. Human Rights of Indigenous Peoples.** [Formerly ANTH 227] Major concepts and legal frameworks for indigenous self-governance, cultural rights, and environmental stewardship. Local and transnational indigenous rights movements. [3] (P)

**ANTH 3135. Development, Social Enterprise, Social Justice.** Theories of economic and human development. Multidimensional approaches to poverty and well-being. Roles of inequality, discrimination, and social justice. Practical focus on social entrepreneurship in international context. [3] (P)

**ANTH 3138. Global Food Politics.** Ecological, political, economic, and cultural dynamics in the world food system. Historical and contemporary agricultural methods. Energy, land use, and climate change. Public health and nutrition. Hunger, food scarcity, and biotechnologies. Commodity chains and labor conditions. Movements for food security, food sovereignty, fair trade, and consumer information. [3] (INT)

**ANTH 3140. Myth, Ritual, Belief: The Anthropology of Religion.** [Formerly ANTH 226] Cross-cultural survey of religious and ritual beliefs in light of theories of religion. Topics include sacrifice, myth, witchcraft, divination, religious change, and millenarian movements. [3] (HCA)

**ANTH 3141. Anthropology of Healing.** [Formerly ANTH 250] Ritual, symbols, belief, and emotion in health, illness, and therapeutic processes. Practices and politics of healing in western and non-western societies, including shamanism, faith healing, ecstatic religious experience, alternative medicine, and biomedicine. Mind-body interactions, medical pluralism, relations between patients and healers, and implications for improving medical care. [3] (P)

**ANTH 3143. Medical Anthropology.** [Formerly ANTH 240] Biocultural aspects of human adaptations to health, disease, and nutrition. Non-Western medical and psychiatric systems. Effects of cultures on the interpretation, diagnosis, and treatment of illness. Case studies from Africa, Oceania, Latin America, and the contemporary United States. [3] (SBS)

**ANTH 3144. Politics of Reproductive Health.** Reproductive health politics, with focus on the United States. Role of broader social, economic, and cultural concerns in diverse positions and public debates. How sexuality, race, class, gender, and disability shape experiences of conception, pregnancy, childbirth, kinship, and new medical technologies. [3] (P)

**ANTH 3145. Sexuality, Gender, and Culture.** Theories and case studies of sexuality and gender in Western and non-Western societies. Cross-cultural perspectives on how class, race, ethnicity, culture, and power influence sexual norms and gender roles. Performativity; masculinity and femininity; kinship; religion and sexuality. No credit for students who have earned credit for 2110. [3] (P)

**ANTH 3150. Cognitive Anthropology.** [Formerly ANTH 262] Methods and approaches in linguistics and cognitive sciences. Exploration of culture and thought, and how culture affects our ways of reasoning, thinking, and behavior. Repeat credit for students who completed 3150W. [3] (SBS)

**ANTH 3150W. Cognitive Anthropology.** Methods and approaches in linguistics and cognitive sciences. Exploration of culture and thought, and how culture affects our ways of reasoning, thinking, and behavior. Repeat credit for students who completed 3150. [3] (SBS)

**ANTH 3160. Anthropologies and Archaeologies of Community.** [Formerly ANTH 222] Creation, maintenance, and transformation of communities through time. Community as a village or settlement, and as an "imagined" or virtual aspect of social identity. Behaviorist, interactionist, discursive, and identity-oriented anthropological approaches to community. Community organization and the built environment. Ancient and modern case studies. [3] (SBS)

**ANTH 3161. Colonial Encounters in the Americas.** [Formerly ANTH 231] Theoretical discussion of colonialism as a sociocultural process. Comparative colonialism in pre- and post-Hispanic contexts. Methodological consideration of archaeological and archival analyses and their complementary epistemological statuses. Pan-American case studies. [3] (SBS)

**ANTH 3162. Material Culture of New World Slavery.** Enslaved Africans' lives in the New World from an archaeological perspective. Housing, artifacts, health, religion, and resistance in North America, South America,

and the Caribbean. Repeat credit for students who earned credit for 294 section 1 in fall 2014. [3] (SBS)

**ANTH 3200. Ancient Cities.** [Formerly ANTH 216] Comparative examination of early cities in the Old World and pre-Columbian America. Analysis of social and economic processes supporting preindustrial urbanism. Role of geography, ideology, trade, and settlement systems in the rise of early urban societies. [3] (SBS)

**ANTH 3202. The Collapse of Civilizations.** [Formerly ANTH 215] Causes of the decline or collapse of complex societies. Old World and New World examples. Historical, anthropological, and paleoecological theories and controversies. [3] (P)

**ANTH 3240. Ancient Mesoamerican Civilizations.** [Formerly ANTH 212] Development of pre-Hispanic civilization in Mesoamerica from the beginnings of village life to the rise of the great states and empires: Olmec, Maya, Toltec, and Aztec civilizations. [3] (INT)

**ANTH 3241. The Aztecs.** [Formerly ANTH 247] Origins of the Aztec peoples of central Mexico and their culture; history and structure of the Aztec empire; pre-Columbian social, political, and economic organization; warfare and religion; the Spanish conquest; colonial society in central Mexico; ethno-graphic study of modern descendants of the Aztecs. [3] (INT)

**ANTH 3243. Ancient Maya Gods and Rulers.** [Formerly ANTH 281] Politics and religion in Classic Maya culture, 100-1000 C.E. Sources and symbols of power, ritual life, and metaphysical underpinnings of hierarchy and cosmology. Relationships among ideology, religion, and politics. Repeat credit for students who have earned credit for 3243W. [3] (SBS)

**ANTH 3243W. Ancient Maya Gods and Rulers.** Politics and religion in Classic Maya culture, 100-1000 C.E. Sources and symbols of power, ritual life, and metaphysical underpinnings of hierarchy and cosmology. Relationships among ideology, religion, and politics. Repeat credit for students who have earned credit for 3243. [3] (SBS)

**ANTH 3250. The Inca Empire.** [Formerly ANTH 254] The rise and fall of the Inca state in the Southern American Andes. Inca society, agriculture, economy, warfare, ancestor worship, mummies, and royal wealth. Imperial expansion, the role of the feasting in Inca politics, and place of ecology in Inca religion. Destruction of the empire during the Spanish conquest; persistence of pre-Columbian culture among Inca descendants in Peru and Bolivia. [3] (INT)

**ANTH 3260. Ceramic Analysis in Archaeology.** [Formerly ANTH 279] Ceramic sherds and vessels from ancient societies. Documentation of form, fabric, and decoration through illustrations. Qualitative and quantitative analysis. Integration with archaeological contexts for ceramic sequences and chronology. Technology, production, exchange, and consumption. Function and style. Emphasis on hands-on experience. [3] (HCA)

**ANTH 3261. Introduction to Geographic Information Systems and Remote Sensing.** [Formerly ANTH 280] Computerized graphics and statistical procedures to recognize and analyze spatial patterning. Spatial data-collection, storage and retrieval; spatial analysis and graphic output of map features. Integration of satellite imagery with data from other sources through hands-on experience. Assumes basic knowledge of computer hardware and software. [3] (MNS)

**ANTH 3262. Ethics in Anthropology, Archaeology, and Development.** [Formerly ANTH 283] Ethical perspectives on contemporary problems of archaeological and anthropological research, interaction, and interpretation of past and present non-Western societies. [3] (P)

**ANTH 3343. Biology and Culture of Race.** [Formerly ANTH 241] Biological and cultural perspectives on race in the United States and internationally. Patterns of human genetic variation. Biomedical use of racial categories. Social and cultural construction of race. Racism and racial discrimination. Racial disparities in health. [3] (P)

**ANTH 3344. Genetic Anthropology Lab Techniques.** [Formerly ANTH 272] Applications of molecular anthropology techniques. DNA data analysis. Genetic methods and findings. DNA comparisons between world populations. Studies of ancient DNA. [3] (MNS)

**ANTH 3371. Social and Health Consequences of Pandemics.** [Formerly ANTH 244] Origins, spread, mortality, and the biological and social consequences. The epidemic of bubonic plague in the 1300s, known as the European Black Death. The devastation of indigenous New World populations by European diseases after 1492. Social and medical responses. Implications for modern societies. [3] (SBS)

**ANTH 3372. Human Osteology.** [Formerly ANTH 270] Anatomy of the human skeleton. Determination of age, sex, stature, and biological affinity from bones and dentition. Analysis of archaeological skeletal remains for diagnosis of disease and identification of cultural practices. Use of human remains in criminal investigation. [3] (MNS)

**ANTH 3620. Maya Language and Literature.** [Formerly ANTH 221] Introduction to a contemporary Maya language. Linguistic analysis and cultural concepts. By permission of instructor. May be repeated for the study of different Maya languages for a total of 6 credits. Repeat credit for students who completed 3620W. [1-6; maximum of 6 credits total for all semesters of ANTH 221] (No AXLE credit)

**ANTH 3622. Classic Maya Language and Hieroglyphs.** [Formerly ANTH 261] Linguistic analysis of Classic Maya hieroglyphs, 100-1000 C.E. Methods of decipherment reading and interpreting an ancient script. Role of socioeconomic status in literacy. Repeat credit for students who completed 3622W. [3] (SBS)

**ANTH 3622W. Classic Maya Language and Hieroglyphs.** Linguistic analysis of Classic Maya hieroglyphs, 100-1000 C.E. Methods of decipherment reading and interpreting an ancient script. Role of socioeconomic status in literacy. Repeat credit for students who completed 3622. [3] (SBS)

**ANTH 3850. Independent Research.** [Formerly ANTH 288A] Readings on selected topics (of the student's choice) and the preparation of reports. [1-3] (No AXLE credit)

**ANTH 3851. Independent Research.** [Formerly ANTH 288B] Readings on selected topics (of the student's choice) and the preparation of reports. [1-3] (No AXLE credit)

**ANTH 3865. Field Research.** [Formerly ANTH 289] Directed field research on topics of the student's choice. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [1-6] (No AXLE credit)

**ANTH 3866. Archaeological Excavation.** Excavation techniques and field recording methods through participation in an archaeological dig. Excavation unit layout, digging techniques, feature and artifact identification. Mapping and field instrumentation. Data registry, statistical analysis, artifact curation, and conservation. Stratigraphy, relative and absolute dating, sampling strategies and techniques, data management. Research design and archaeological ethics. [4] (MNS)

**ANTH 3880. Internship Training.** [Formerly ANTH 287B] Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 will not count toward the Anthropology major or minor. Students from any discipline can gain experience working with a local, national, or international organization in developing a project to broaden their understanding of anthropological issues. Hours for background readings and research will be completed in ANTH 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in ANTH, and prior approval of the student's plan by the director of undergraduate studies in Anthropology are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

**ANTH 3881. Internship Readings and Research.** [Formerly ANTH 287A] Readings and research conducted under the supervision of a member of the Anthropology department and a substantial research paper are required. Students from any discipline can gain experience working with a local, national, or international organization in developing a project to broaden their understanding of anthropological issues. Hours for background readings and research will be completed in ANTH 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in ANTH, and prior approval of the student's plan by the director

of undergraduate studies in Anthropology are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3880. [Variable credit: 1-6] (No AXLE credit)

**ANTH 3890. Special Topics.** [Formerly ANTH 294] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**ANTH 3900. Theories of Culture and Human Nature.** [Formerly ANTH 206] Survey of the views of anthropological thinkers, from the late nineteenth century to the present, about the basic attributes of humankind and human culture. Comparison of different ideas of how people create culture and in turn are molded by culture. [3] (SBS)

**ANTH 3901. Problems in Anthropological Theory.** [Formerly ANTH 284] An advanced seminar in anthropological theory: cultural evolution, cultural history, ethnic relations, cultural ecology, archaeological method and theory, social structure, political organizations, religious institutions. [3] (SBS)

**ANTH 4152. Activism and Social Change: Theory, Experience, and Practice.** [Formerly ANTH 286] Introduction to theory and ethics of social activism and advocacy. Roles of academics and scholars. Theories of political organizing and mobilization. Application of anthropological research methods. Case studies in local, national, and global social issues, processes of civic mobilization, and social change. [3] (SBS)

**ANTH 4153. Economic Anthropology.** [Formerly ANTH 234] Modern and postmodern cultural organization of Western and non-Western economies. Crosscultural comparison of concepts of self-interest and rationality. Relation of the growth of post-industrial (service and information) economies to economic strategies of ethnic groups. Survey of indigenous alternatives to development. Theoretical issues grounded in case studies from our own and other cultures. [3] (SBS)

**ANTH 4154. Environmental Anthropology.** [Formerly ANTH 207] The relationship between human beings and the environments that sustain them. Global diversity of human ecological adaptations. Hunter-gatherers, pastoral nomads, slash-and-burn agriculturalists, and irrigation agriculturalists. Human impact on the environment. Theories of human ecological interaction. [3] (SBS)

**ANTH 4155. Realities and Worldviews: Why Culture Matters.** [Formerly ANTH 255] Worldviews and constructed realities that influence human behavior. Stereotyping and conflict as triggered by ontological misunderstandings. Western ontology, science, and understanding the Other. Interaction of worldviews and human behavior such as in resource management and public health. Offered on a graded basis only. [3] (SBS)

**ANTH 4345. Human Evolutionary Genetics.** [Formerly ANTH 273] Core issues in human evolution and population genetics. Molecular evidence for the origin of modern humans, reconstruction of human migrations, race, and detection of admixture between populations. Implications for human disease. Offered on a graded basis only. No credit for students who earned credit for 294 section 1 in fall 2012. Prerequisite or corequisite: BSCI 1100, BSCI 1105, or BSCI 1510. [3] (MNS)

**ANTH 4373. Health and Disease in Ancient Populations.** [Formerly ANTH 274] Paleopathology of mummies and skeletons. Skeletal evidence for violence and warfare. Gender and social status differences in diet, disease, and activity patterns to reconstruct ancient social organization. Biological relationships among ancient and modern populations. Ethics and federal law in the study of human remains. Laboratory analysis of skeletons. [3] (MNS)

**ANTH 4998. Honors Research.** [Formerly ANTH 298] Research to be done in consultation with a member of the faculty in anthropology. Open only to those beginning honors work in anthropology. May be repeated for a total of 6 credits. [1-6; maximum of 6 credits total for all semesters of 4998] (No AXLE credit)

**ANTH 4999. Honors Thesis.** [Formerly ANTH 299] Open only to seniors in the departmental honors program. Students completing this course with distinction, including a thesis and final examination, will earn honors in anthropology. Prerequisite: 4998. May be repeated for a total of 6 credits

if there is no duplication in topic. [1-6; maximum of 6 credits total for all semesters of 4999] (No AXLE credit)

## Arabic

**ARA 1101. Elementary Arabic.** [Formerly ARA 210A] Development of reading, listening, speaking, and writing skills. No credit for students who have earned credit for a more advanced Arabic language course. [5] (No AXLE credit)

**ARA 1102. Elementary Arabic.** [Formerly ARA 210B] Continuation of 1101. Development of reading, listening, speaking, and writing skills. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 1101. [5] (INT)

**ARA 2201. Intermediate Arabic.** [Formerly ARA 220A] Practice and development of language skills at the intermediate-advanced level. Intensive work in spoken Arabic with emphasis on vocabulary acquisition, reading comprehension, and writing skills. Advanced grammar, modern Arabic word formation, verb aspect usage, and structure of complex sentences. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 1102. [3] (INT)

**ARA 2202. Intermediate Arabic.** [Formerly ARA 220B] Continuation of 2201. Practice and development of language skills at the intermediate-advanced level. Intensive work in spoken Arabic with emphasis on vocabulary acquisition, reading comprehension, and writing skills. Advanced grammar, modern Arabic word formation, verb aspect usage, and structure of complex sentences. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 2201. [3] (INT)

**ARA 3101. Advanced Arabic.** [Formerly ARA 230A] Further development of listening, reading, speaking, and writing skills in the Arabic language. Emphasis on grammar and literary techniques. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 2202. [3] (INT)

**ARA 3102. Advanced Arabic.** [Formerly ARA 230B] Continuation of 3101. Further development of listening, reading, speaking, and writing skills in the Arabic language. Emphasis on grammar and literary techniques. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 3101. [3] (INT)

**ARA 3201. Media Arabic.** [Formerly ARA 240] Listening to, discussing, simulating, and analyzing Arabic media materials. Coverage of current and historical events, such as TV broadcasts, headline news, documentaries, and public discussions on political, religious, and cultural issues. Offered on a graded basis only. Prerequisite: 3102. [3] (INT)

**ARA 3301. Arabic of the Qur'an and Other Classical Texts.** [Formerly ARA 250] Syntactical and morphological features of Classical Arabic. Differences and similarities with Modern Standard Arabic in vocabulary usage, semantic extensions, and context. Vocabulary borrowing. Texts drawn from the Qur'an, Hadith, and Sira (biographical) literature. Prerequisite: 2201. [3] (INT)

## Art Studio

**ARTS 1001. Commons Seminar.** [Formerly ARTS 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

**ARTS 1099. Maymester Contemporary Art Blitz.** [Formerly ARTS 285] Intensive review of contemporary art through excursions to museums, galleries, and artists' studios. Insights from curators, dealers, and films. Cities vary each year. May be repeated for credit more than once if there is no duplication in topic. [3] (HCA)

**ARTS 1101. Introduction to Studio Art.** [Formerly ARTS 101] Processes, fundamental elements, and principles of art. Drawing, painting, printmaking, sculpture, photography, installation, and time-based art. [3] (HCA)

**ARTS 1102. Drawing and Composition I.** [Formerly ARTS 102] Introduction to drawing: visual problems related to observation, idea formation,

composition, media, and various forms of expression. Figure and landscape may be included. [3] (HCA)

**ARTS 1111. First-Year Writing Seminar.** [Formerly ARTS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**ARTS 1200. Photography I.** [Formerly ARTS 120] Black-and-white photography. The aesthetics and techniques of the black-and-white medium; 35mm camera use, film exposure, image quality, and darkroom practices. [3] (HCA)

**ARTS 1201. Alternative Photography.** [Formerly ARTS 121] Methods in image making. Photographic narratives, book making, pinhole cameras. [3] (HCA)

**ARTS 1202. Digital Imaging I.** [Formerly ARTS 122] Creation of still, photo-based images using digital cameras, scanners, and computer software for digital output. Issues in contemporary art. [3] (HCA)

**ARTS 1300. Painting.** [Formerly ARTS 130] Technical and conceptual aspects of painting. Individual instruction based on ability and experience. Prerequisite: 1102. [3] (HCA)

**ARTS 1400. Ceramics.** [Formerly ARTS 140] Introduction to ceramic design and preparation of clay objects. Hand-building, wheel-throwing, ceramic sculpture, surface enrichment, glazing, and kiln-firing. [3] (HCA)

**ARTS 1401. Sculptural Ceramics.** [Formerly ARTS 141] Expressive art forms in clay. Assembled components, surface enrichment, and firing techniques. [3] (HCA)

**ARTS 1500. Sculpture.** [Formerly ARTS 150] Changing concepts, materials, and processes in sculpture. Individual instruction based on ability and experience. [3] (HCA)

**ARTS 1501. Assemblage.** [Formerly ARTS 151] Additive processes in sculpture. Problems involving found objects, kinetic/time-based ideas, and site-specific installations. [3] (HCA)

**ARTS 1502. Installation Art.** [Formerly ARTS 152] Historical survey from 1900 to present; studio practice; formal and conceptual issues. [3] (HCA)

**ARTS 1503. Text and Image.** [Formerly ARTS 112] Intersection of art and writing. History, theory, and practice. Zines, posters, photography, new media, and artists' books. [3] (HCA)

**ARTS 1600. Printmaking I: Relief and Intaglio.** [Formerly ARTS 110] Introduction to printmaking media, including relief and etchings. Traditional and experimental approaches. Prerequisite: 1102. [3] (HCA)

**ARTS 1601. Printmaking I: Screen Printing and Lithography.** [Formerly ARTS 111] Introduction to printmaking media, including screen printing and lithography. Traditional and experimental approaches. Prerequisite: 1102. [3] (HCA)

**ARTS 1700. Video Art.** [Formerly ARTS 171] Video as an art form. Group and individual productions. Viewing and discussion. Project analysis and critique. Relationship to such traditional media as photography and film. [3] (HCA)

**ARTS 1701. Performance Art.** [Formerly ARTS 172] History, theory, and practice of performance. Vocal studies and conceptual music, personal narrative, performance as a response to the cult-of-celebrity, body art, and performance with new technologies. Collaborative and solo performance projects. [3] (HCA)

**ARTS 1702. Portable Media I.** [Formerly ARTS 173] Creative potential of inexpensive, portable digital media devices. Establishment of a rapid rhythm of practice and experimentation to build an inventory of ideas, methods, and techniques. Historic and contemporary developments in narrative and non-narrative digital video production. [3] (HCA)

**ARTS 1800. Sources of Contemporary Art.** [Formerly ARTS 180] Contemporary studio art practice, issues, and theories. Visual and conceptual

influences on living artists; idea formation. Students must participate in artist-in-residence projects. [3] (HCA)

**ARTS 1900. Social Collective Art Practice.** [Formerly ARTS 190] History and practice of making art within the social collective experience. Small group projects based on everyday living in The Commons. No credit for students who have taken 1111 section 1. [3] (HCA)

**ARTS 2100. Drawing and Composition II.** [Formerly ARTS 202] Prerequisite: 1102. [3] (HCA)

**ARTS 2101. Life Drawing I.** [Formerly ARTS 205] Methods used to depict form and structures of the human figure. Gesture, sighting and measuring, contour drawing, and value. Planar and anatomical analysis. Metaphorical and narrative use of the human figure in art. Prerequisite: 1102. [3] (HCA)

**ARTS 2102. Drawing: Color Media I.** [Formerly ARTS 207] Drawing on paper with wet and dry color media. Traditional and experimental approaches. Prerequisite: 1102. [3] (HCA)

**ARTS 2200. Photography II.** [Formerly ARTS 220] Concepts and techniques of contemporary photographic practice; experimental projects and workshops using analog and digital media. Issues in contemporary art. Prerequisite: 1200, 121, or 1202. [3] (HCA)

**ARTS 2202. Digital Imaging II.** [Formerly ARTS 222] Advanced exploration of digital software and its integration with traditional media. Personal projects and critiques. Issues in contemporary art. Prerequisite: 1202. [3] (HCA)

**ARTS 2300. Painting II.** [Formerly ARTS 230] Prerequisite: 1300. [3] (HCA)

**ARTS 2400. Ceramics II.** [Formerly ARTS 240] Development of ceramic design, both traditional and contemporary, functional and sculptural. Projects develop technical and aesthetic goals. Instruction includes demonstrations, slide presentations, field trips, guest artists, reports. Demonstrations include advanced throwing, complex constructions, glaze development with applications, and kiln-firing. Prerequisite: 1400. [3] (HCA)

**ARTS 2401. Concept and Clay: Composite Forms.** [Formerly ARTS 241] Technical ability in handling clay and conceptual and interpretive elements in functional and/or sculptural forms. Individual solutions in form and surface. Prerequisite: 1400 or 1401. [3] (HCA)

**ARTS 2500. Sculpture II.** [Formerly ARTS 250] Prerequisite: 1500, 1501, or 1502. [3] (HCA)

**ARTS 2502. Advanced Installation Art.** [Formerly ARTS 252] Techniques, processes, and placement. Conceptual and historical practices. Prerequisite: 1502. [3] (HCA)

**ARTS 2600. Printmaking II.** [Formerly ARTS 210] Advanced study in traditional and experimental printmaking processes. Prerequisite: 1600 or 1601. [3] (HCA)

**ARTS 2700. Video Art II.** [Formerly ARTS 271] Viewing, discussion, analysis and critiques. Relationship to photography, film, and performance. Group and individual productions. Prerequisite: 1700. [3] (HCA)

**ARTS 2701. Performance Art II.** [Formerly ARTS 272] History, theory, and practice. Vocal studies, conceptual music, personal narrative, performance as a response to the cult-of-celebrity, body art and performance with new technologies. Collaborative and individual performance projects. Prerequisite: 1701. [3] (HCA)

**ARTS 2702. Portable Media II.** [Formerly ARTS 273] Advanced exploration in use of portable digital media devices. Variety of methods for conceptualizing and making projects; enhanced art making skills. Prerequisite: 1700, 1701, or 1702. [3] (HCA)

**ARTS 3100. Drawing and Composition III.** [Formerly ARTS 203] Prerequisite: 1102 and 2100. [3] (HCA)

**ARTS 3101. Life Drawing II.** [Formerly ARTS 206] Prerequisite: 2101. [3] (HCA)

**ARTS 3102. Drawing: Color Media II.** [Formerly ARTS 208] Prerequisite: 2102. [3] (HCA)

**ARTS 3200. Photography III.** [Formerly ARTS 221] Personal projects and critiques. Interdisciplinary possibilities. Issues in contemporary art. Prerequisite: 2200 or 2202. [3] (HCA)

**ARTS 3300. Painting III.** [Formerly ARTS 231] Prerequisite: 2300. [3] (HCA)

**ARTS 3600. Printmaking III.** [Formerly ARTS 211] Advanced study in traditional and experimental printmaking processes. Prerequisite: 2600. [3] (HCA)

**ARTS 3851. Independent Research.** [Formerly ARTS 289] Supervised work beyond regular offerings in the curriculum. Students may only register with consent of instructor involved and with written approval of the director of undergraduate studies. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of ARTS 3851] (No AXLE credit)

**ARTS 3891. Selected Topics.** [Formerly ARTS 288] May be repeated for a total of 9 credits if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 9 credits total for all semesters of ARTS 3891] (HCA)

**ARTS 3970. Directed Study: Senior Show and Contemporary Practices.** [Formerly ARTS 290] Theoretical and practical concerns including professional practices for artists. Students visit exhibitions and discuss contemporary art with directed readings and lectures, participate in critiques, and exhibit their work. Seniors with a concentration in art only. [3] (HCA)

**ARTS 3971. Independent Research: Senior Show.** [Formerly ARTS 291] Research conducted under faculty supervision specifically in preparation for the Senior Show. Open only to senior majors in their final term. [3] (No AXLE credit)

**ARTS 4998. Senior Honors Research.** [Formerly ARTS 299A] Research conducted in consultation with a faculty member in Art. Offered on a graded basis only. Open only to honors majors. [3] (No AXLE credit)

**ARTS 4999. Senior Honors Thesis.** [Formerly ARTS 299B] Research conducted in consultation with a faculty member in Art. Offered on a graded basis only. Open only to senior honors majors. [3] (No AXLE credit)

## Asian Studies

**ASIA 1001. Commons Seminar.** [Formerly ASIA 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ASIA 1111. First-Year Writing Seminar.** [Formerly ASIA 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**ASIA 1201. Writing Southeast Asia.** [Formerly ASIA 150] Literary representations, including novels and personal memoirs, of the history of Southeast Asia. Colonial and postcolonial periods. Representations of pluralistic cultures, diverse languages, religions, and indigenous and national identities. Indonesia, Myanmar, Philippines, Thailand, and Vietnam. All texts in English translation. [3] (HCA)

**ASIA 1680. Inside China.** [Formerly ASIA 236] First-hand experience of China's dynamic society and expanding economy. Guided exploration of famous historical sites and contemporary institutions such as hospitals, businesses, factories, and art galleries in Beijing and Shanghai. Interviews with individuals from many different walks of life, including physicians, entrepreneurs, migrant workers, and college students. No knowledge of Chinese is required. Offered on a graded basis only. [3] (INT)

**ASIA 2100W. Fashioning the Self: Coming of Age and Asian Modernities.** [Formerly ASIA 200W] The coming-of-age novel (Bildungsroman) as a literary form in twentieth-century Asia. Travails of modernity and colonialism; the effects of crossing national, racial, and cultural boundaries; the experiences of traveling to urban centers, foreign countries, and ancestral lands.

Texts from China, Indonesia, Japan, Philippines, and Vietnam. Taught in English. [3] (INT)

**ASIA 2210W. Hollywood Hanoi.** [Formerly ASIA 250W] Cultural narratives of the Vietnam War, including novels and films. War and representation. International, minority, and antiwar perspectives on the violence and aftermath. Muhammad Ali, Werner Herzog, Jean Genet, Graham Greene, and Dinh Linh. All texts in English translation. No credit for students who have earned credit for 1111 section 4. [3] (INT)

**ASIA 2511. Popular Culture in Modern Japan.** [Formerly ASIA 211] Popular culture in Japan from 1900 to the present. The rise of mass culture and media, song, sports, food, fashion, and popular film genres. [3] (INT)

**ASIA 2512. Explorations of Japanese Animation.** [Formerly ASIA 212] Introduction to the form and content of Japanese animation as globalized popular entertainment and as a speculative artistic medium that explores history and memory, nature and technology, human identity, carnivalesque comedy, and gender relations. [3] (INT)

**ASIA 2513W. Media Monsters in Contemporary Japan.** [Formerly ASIA 213W] The supernatural and the monstrous as represented in the context of mass media and consumerism in contemporary Japan. Live-action J-horror films, popular fiction, Manga, animated films, and television series. [3] (HCA)

**ASIA 2560. Current Japan-U.S. Relations.** [Formerly ASIA 240] Similarities and differences in theory and practice in the United States and Japan on public policy issues such as trade, defense, environment, education, medical care, and racial prejudice. [3] (INT)

**ASIA 2605. Romancing the Nation in Modern Chinese Literature.** From the fourteenth century to the present. Fiction, drama, and poetry. Family relations and nation-state in romantic writings. Knowledge of Chinese is not required. [3] (HCA)

**ASIA 2606. Martial Tradition in Chinese Literature.** From eleventh century BCE to modern period. War, banditry, revenge, cannibalism, female knight-errant. All genres of literature, supplemented by visual material, theater, and film. Knowledge of Chinese is not required. [3] (HCA)

**ASIA 2607. Self and Society in Pre-modern Chinese Literature.** From the seventeenth-century BCE to the seventeenth-century CE. Poetry, prose, fiction, and drama. Self, society, religion, gender, and print culture. Offered on a graded basis only. No credit for students who have earned credit for 3891 section 01 offered fall 2015. Knowledge of Chinese is not required. [3] (HCA)

**ASIA 2608. Chinese Drama: 13th to 20th Centuries.** Traditional and modern Chinese drama. Text, image, and performance. Gender, religious thinking, commerce, and censorship. Offered on a graded basis only. Knowledge of Chinese not required. [3] (HCA)

**ASIA 2609W. Writing and Gender in Traditional China.** Pre-modern China: 1st century CE to 20th century CE. Women writers, women in family and society, gender relations, cross-dressing, and foot-binding. Poetry, prose, drama, fiction, and visual materials. Offered on a graded basis only. [3] (HCA)

**ASIA 2630. Chinese Medicine.** (Formerly HIST 282). [Formerly ASIA 230] Historical encounters and divergences between medicine in China and in the West. Chinese medical classics, including the Inner Canon of the Yellow Emperor and early herbal manuals. The creation of Traditional Chinese Medicine in the People's Republic of China and the emergence of Chinese medicine as alternative medicine in the U.S. Serves as repeat credit for students who completed HIST 282 prior to fall 2012 or HIST 248 prior to fall 2008. [3] (P)

**ASIA 3151. The Third World and Literature.** [Formerly ASIA 251] The history of cultural and political concepts of the Third World from 1955 to the present. Contemporary literary and cultural debates regarding models of transnationalism and processes of globalization. National literatures and cultures foundational to the Third World model. The relationship between the genre of the novel and the formation of national communities. [3] (INT)

**ASIA 3633. Self-Cultivation in Ancient China.** [Formerly ASIA 233] 300 BCE to 500 CE. Methods, goals, and contexts of self-cultivation in antiquity. Breathing exercises, meditation, visualization, sexual arts, sacrifice, alchemy, and other practices in their religious, cultural, and social contexts. [3] (INT)

**ASIA 3851. Independent Study.** [Formerly ASIA 289A] Designed primarily for majors who want to study Asian topics not regularly offered in the curriculum. Must have consent of instructor. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**ASIA 3852. Independent Study.** [Formerly ASIA 289B] Designed primarily for majors who want to study Asian topics not regularly offered in the curriculum. Must have consent of instructor. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**ASIA 3891. Special Topics.** [Formerly ASIA 294A] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3] (No AXLE credit)

**ASIA 3892. Special Topics.** [Formerly ASIA 294B] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3] (No AXLE credit)

**ASIA 3980. Junior Honors Readings.** [Formerly ASIA 297] May be repeated for credit more than once. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**ASIA 4998. Honors Research.** [Formerly ASIA 299A] Research conducted in consultation with a member of the faculty or affiliated faculty of the program. Open only to senior honors majors. [1-3] (No AXLE credit)

**ASIA 4999. Honors Research.** [Formerly ASIA 299B] Research conducted in consultation with a member of the faculty or affiliated faculty of the program. Open only to senior honors majors. Prerequisite: 4998. [1-3] (No AXLE credit)

## Astronomy

**ASTR 1001. Commons Seminar.** [Formerly ASTR 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ASTR 1010. Introductory Astronomy: Stars and Galaxies.** [Formerly ASTR 102] Observed and physical properties of stars. Supernovae, neutron stars, and black holes. Our Milky Way galaxy and other galaxies. Cosmology, dark matter, dark energy, and the Big Bang. No credit for students who have earned credit for 1210 or 3000. [3] (MNS)

**ASTR 1010L. Introductory Nighttime Astronomy Laboratory.** [Formerly ASTR 103] Motion of the celestial sphere and apparent and real motions of celestial bodies as viewed from inside the Milky Way. Observations of meteor showers, comets, and artificial satellites. Telescopic observations of astronomical objects. Stellar spectra. Laboratory ordinarily accompanied by 1010 or 3000. Satisfies the AXLE lab course requirement when completed with 1010 or 3000. No credit for students who have earned credit for 1020L or 1210. [1] (No AXLE credit)

**ASTR 1020L. Introductory Daytime Astronomy Laboratory.** [Formerly ASTR 104] Phases of the Moon, colors of stars, shapes and motions of galaxies, properties of exoplanets, and ages of star clusters. Telescopic observations of the Sun. Laboratory ordinarily accompanied by 1010 or 3000. Satisfies the AXLE lab course requirement when completed with 1010 or 3000. No credit for students who have earned credit for 1010L or 1210. [1] (No AXLE credit)

**ASTR 1111. First-Year Writing Seminar.** [Formerly ASTR 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of



6 credits total for all semesters of 1111] (AXLE credit category varies by section)]

**ASTR 1210. Introduction to Observational Astronomy.** [Formerly ASTR 122] Telescopic and naked eye observations. Light, optics, telescopes, and CCD cameras. Motions of the sky. Kepler's laws. Phases and topography of the Moon. Distances, temperatures, and brightnesses of stars. Star clusters. Dark matter. Taught entirely at Dyer Observatory using 24-inch telescope. Satisfies the AXLE lab course requirement. Students who have earned credit for 1010 or 3000 will earn one credit hour for this course. Students who have earned credit for 1010L or 1020L will earn three credit hours for this course. Students who have earned credit for 1010L or 1020L and either 1010 or 3000 will earn no credit hours for this course. [4] (MNS)

**ASTR 2110. The Solar System.** [Formerly ASTR 201] The sky, ancient astronomy, orbits and gravity; seasons, the calendar, phases and motions of the moon; tides, eclipses, light and telescopes, the terrestrial planets, the giant planets and their moons and rings, asteroids, comets, meteorites, extra-solar planets, formation of planetary systems, the sun. [3] (MNS)

**ASTR 2130. The Trial of Galileo and its Background.** [Formerly ASTR 203] The interdependence of cosmological theories and religious teachings from the eighth century BCE to the end of the seventeenth century. Examines scientific works and religious texts, including those of Aristotle, Thomas Aquinas, Copernicus, Luther, Galileo, and Newton. [3] (P)

**ASTR 2600. Undergraduate Seminar.** [Formerly ASTR 250] Directed readings and discussions of current topics in astronomy. Normally limited to juniors and seniors with preference to majors. Prerequisite: 1010 or one semester of calculus-based physics. May be repeated for credit more than once, but students may earn only 1 credit per semester of enrollment. [1] (No AXLE credit)

**ASTR 3000. Principles of Astrophysics.** [Formerly ASTR 205] Origin and evolution of matter. The tools and methods of astrophysics, including light and telescopes. Cosmology and the Big Bang. Galaxies and star formation; physics of stars, including nucleosynthesis and stellar death; the solar system and the search for other worlds. Prerequisite: either PHYS 1501, 1601 or 1901 and either MATH 1200 or 1300. [3] (MNS)

**ASTR 3600. Stellar Astrophysics.** [Formerly ASTR 252] Physics of stellar structure and evolution, including nuclear energy generation, equations of state, and heat transfer by radiation and convection. Numerical stellar models. Observational aspects of stellar astrophysics. Prerequisite: either MATH 2400, 2420, or 2610; either PHYS 3200 or 3207; and either PHYS 2250 or 2250W. [3] (MNS)

**ASTR 3700. Galactic Astrophysics.** [Formerly ASTR 253] Interstellar matter and gaseous nebulae, the structure and evolution of normal galaxies, active galactic nuclei and quasars, and observational cosmology. No credit for students who have earned credit for 8040. Prerequisite: MATH 2400, 2420, or 2610 and either PHYS 2250 or 2250W. [3] (MNS)

**ASTR 3800. Structure Formation in the Universe.** [Formerly ASTR 254] Observational and theoretical aspects of extragalactic astronomy. Measurements of galaxies and of the large-scale structure of the universe from galaxy surveys. Expansion history of universe; roles of dark matter and energy. Growth of density fluctuations in universe due to gravity. Cosmological N-body simulations and formation of dark matter halos. Physics of galaxy formation. Experimental probes of dark matter and energy. Prerequisite: One of PHYS 1501, 1601, or 1901; and one of PHYS 1502, 1602, or 1902; and one of MATH 2400, 2420, or 2610; and one of CS 1101 or 1103. [3] (MNS)

**ASTR 3840. Directed Studies.** [Formerly ASTR 289] Individual research or readings under close faculty supervision. May be repeated for a total of 10 credits, but students may earn only up to 5 credits per semester of enrollment. [1-5; maximum of 10 credits total for all semesters of ASTR 3840] (No AXLE Credit)

**ASTR 3860. Independent Study.** [Formerly ASTR 291] Introduction to independent research and scholarly investigation under faculty supervision. May be repeated for a total of 10 credits, but students may earn only up to 6 credits per semester of enrollment. [1-6; maximum of 10 credits total for all semesters of ASTR 3860] (No AXLE credit)

**ASTR 3900. General Relativity and Cosmology.** [Formerly ASTR 260] Introduction to Einstein's theory describing gravity as a curvature of spacetime. Tensor analysis, special relativity, differential geometry, space-time curvature, the Einstein field equations, the Schwarzschild metric for stars and black holes, and the Friedmann-Robertson-Walker metric for cosmology. Prerequisite: PHYS 2270 and 2290. [3] (MNS)

**ASTR 4998. Honors Research and Senior Thesis.** [Formerly ASTR 296] Independent experimental or theoretical investigations of basic problems under faculty supervision which culminate in a written thesis submitted to the faculty. Required for departmental honors. Open to senior majors with departmental approval. May be repeated for a total of 10 credits, but students may earn only up to 6 credits per semester of enrollment. [1-6; maximum of 10 credits total for all semesters of ASTR 4998] (No AXLE credit)

## Biochemistry and Chemical Biology

**BCB 2101. Chemical Biology Focus.** Roles of proteins, lipids, nucleic acids, and carbohydrates in human disease. Experimental techniques. Prerequisite: CHEM 2221 and BSCI 1510. [1] (No AXLE credit)

**BCB 3101. Special Topics in Chemical Biology.** May be repeated for credit more than once if there is no duplication in topic. Prerequisite: CHEM 3710. [3] (MNS)

**BCB 3201. Independent Laboratory Research.** Original student research under the supervision of faculty associated with the Biochemistry and Chemical Biology major. Design and execution of a scientific problem. Enrollment by arrangement before the end of the previous semester. Prerequisite: BSCI 1510 and CHEM 1020 or 1602, consent of Biochemistry and Chemical Biology Director of Undergraduate Studies, 3.0 cumulative grade point average. May be repeated for credit more than once, but students may earn only up to 6 credits per semester of enrollment. [2-6] (No AXLE credit)

**BCB 4320. Advanced Chemical Biology.** (Also listed as CPBP 8320 Foundations in Chemical Biology) Overviews and in-depth case studies on the breadth of chemical biology. Importance of chemical biology in advancing biological sciences. Offered on a graded basis only. Prerequisite: CHEM 3710 [3] (MNS)

## Biological Sciences

**BSCI 1001. Commons Seminar.** [Formerly BSCI 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**BSCI 1100. Biology Today.** [Formerly BSCI 100] Broad coverage of the biological sciences presenting evolution as the unifying concept. Particular emphasis on basic biological processes in cells and the relationships/interactions between organisms and their environment. Topics include cell structure and function, genetics and inheritance, evolution and diversity, populations, communities and ecosystems, and topics related to biology and society. Students who take 1510-1511 shall not receive credit for 1100. Corequisite: 1100L. [3] (MNS)

**BSCI 1100L. Biology Today Laboratory.** [Formerly BSCI 101A] Laboratory investigations of the genetics, physiology, and ecology of plants and animals. One three-hour laboratory per week to accompany 1100. Students who take 1510L, 1511L or 1512L shall not receive credit for 1100L. Corequisite: 1100. Satisfies the AXLE lab course requirement when completed with 1100. [1] (No AXLE credit)

**BSCI 1103. Green Earth: The Biodiversity and Evolution of Plants.** [Formerly BSCI 118] Biodiversity of plants, their adaptations to the environment, and their evolutionary and ecological relationships. Basic biology of plant form and function and the importance of plants for life on Earth. Not intended for students planning to major in biological sciences. Three hours of lecture and one laboratory period per week. [4] (MNS)

**BSCI 1105. Human Biology.** [Formerly BSCI 105] Recent advances in genetics, reproduction, and biotechnology. Social, legal, and ethical implications. Three lectures and one laboratory period per week. Not intended for students majoring in Biological Sciences. Students who take 1510-1511 may not receive credit for 1105. [4] (MNS)

**BSCI 1111. First-Year Writing Seminar.** [Formerly BSCI 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**BSCI 1510. Introduction to Biological Sciences.** [Formerly BSCI 110A] An integrative approach to the science of life for science and engineering students. Macromolecular structure and function. Cell structure, reproduction, metabolism, and energy production. Genomes, replication, gene structure, RNA, and protein synthesis. Students who have completed 1100 or 1105 will forfeit full credit for 1100 or three hours of credit for 1105 upon completion of this course. Prerequisite or corequisite: CHEM 1601. [3] (MNS)

**BSCI 1510L. Biological Sciences Laboratory.** [Formerly BSCI 111A] Laboratory to accompany 1510. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1510. Students who have completed 1100L or 1105 will forfeit full credit for 1100L or one hour of credit for 1105 upon completion of this course. Prerequisite or corequisite: 1510. [1] (No AXLE credit)

**BSCI 1511. Introduction to Biological Sciences.** [Formerly BSCI 110B] Continuation of 1510. Cell communication. Physiology, organ function and development. Mendelian and population genetics. Evolution, ecology, and speciation. Populations, ecosystems, and conservation biology. Students who have completed 1100 or 1105 will forfeit full credit for 1100 or three hours of credit for 1105 upon completion of this course. Prerequisite: 1510. [3] (MNS)

**BSCI 1511L. Biological Sciences Laboratory.** [Formerly BSCI 111B] Laboratory to accompany 1511. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1511. No credit for students who have earned credit for 1512L. Students who have earned credit for 1100L or 1105 will forfeit full credit for 1100L or one hour of credit for 1105 upon completion of this course. Prerequisite or corequisite: 1511. [1] (No AXLE credit)

**BSCI 1512L. Biological Sciences Laboratory.** [Formerly BSCI 111C] Alternative to 1511L. Directed research projects with emphasis on experimental design and analysis. Satisfies the AXLE lab course requirement when completed with 1511. Offered on a graded basis only. No credit for students who have earned credit for 1511L. Students who have earned credit for 1100L or 1105 will forfeit full credit for 1100L or one hour of credit for 1105 upon completion of this course. Prerequisite or corequisite: 1511. Prerequisite: 1510L. [2] (No AXLE credit)

**BSCI 2056. Non-Equivalent Credit (BSCI Introductory Lab).** [Formerly 71CT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Introductory Lab requirement of the BSCI major or minor.

**BSCI 2201. Introduction to Cell Biology.** [Formerly BSCI 201] Structure and function of cells, subcellular organelles, and macromolecules. Fundamentals of organelle function, membrane transport, energy production and utilization, cell motility, cell division, intracellular transport and mechanisms of signal transduction. Prerequisite: 1510. [3] (MNS)

**BSCI 2201L. Cell Biology Laboratory.** [Formerly BSCI 202] One three-hour laboratory and discussion period per week. Satisfies the AXLE lab course requirement when completed with 2201. Prerequisite or corequisite: 2201. [1] (No AXLE credit)

**BSCI 2205. Evolution.** [Formerly BSCI 205] Evolutionary theory, with emphasis on evolutionary mechanisms. Microevolutionary processes of adaptation and speciation and macro-evolutionary patterns. Evidence from genetics, ecology, molecular biology, and paleontology in the historical context of the neo-Darwinian synthesis. Three lectures per week. No credit for graduate students in Biological Sciences. Prerequisite: 1511. [3] (MNS)

**BSCI 2210. Principles of Genetics.** [Formerly BSCI 210] Basic principles and mechanisms of inheritance discussed and related to other biological phenomena and problems. Prerequisite: 1511. [3] (MNS)

**BSCI 2210L. Genetics Laboratory.** [Formerly BSCI 211] One three-hour laboratory and discussion period per week. Satisfies the AXLE lab course requirement when completed with 2210. Prerequisite or corequisite: 2210. [1] (No AXLE credit)

**BSCI 2218. Introduction to Plant Biology.** [Formerly BSCI 218] Diversity of plants within the framework of their evolution and environmental adaptations. Biomes from the tropical rain forest to the Vanderbilt arboretum. Three lectures and one laboratory per week. Prerequisite: 1511. [4] (MNS)

**BSCI 2219. Introduction to Zoology.** [Formerly BSCI 219] A structural and functional study of the major animal groups. The problems presented to animals by their environments, and the anatomical and physiological mechanisms by which they adapt. Three lectures and one laboratory period per week. Prerequisite: 1511. [4] (MNS)

**BSCI 2238. Ecology.** [Formerly BSCI 238] Population biology, evolutionary ecology, community structure, with emphasis on species interactions, including competition, predation, and symbiosis. Prerequisite: 1511. [3] (MNS)

**BSCI 2238L. Ecology Lab.** [Formerly BSCI 237] One three-hour laboratory and discussion period or field trip per week. Satisfies the AXLE lab course requirement when completed with 2238. Prerequisite or corequisite: 2238. [1] (No AXLE credit)

**BSCI 2520. Biochemistry.** [Formerly BSCI 220] Structure and mechanism of action of biological molecules, proteins, nucleic acids, lipids, and polysaccharides. Enzymology. Carbohydrate metabolism. Prerequisite: 1510 and either CHEM 2212 or 2222. [3] (MNS)

**BSCI 3226. Immunology.** [Formerly BSCI 226] The molecular and cellular basis of immunity. Emphasis on molecular structure, the genetic origin of diversity in B-cell and T-cell receptors, antigen presentation, and the cellular interactions leading to the immune response. Tolerance, tumor and transplantation immunity, autoimmune and immunodeficiency diseases, and allergy. Prerequisite: 2201 or 2210. [3] (MNS)

**BSCI 3230. Biological Clocks.** [Formerly BSCI 230] Study of innate mechanisms for measurement of time in living organisms. Emphasis on the functional significance and physiological basis of biological clocks in animals and humans. Topics include circadian rhythms, time-compensated celestial navigation, photoperiodism, and the role of biological clocks in human behavior. Prerequisite: 1511. [3] (MNS)

**BSCI 3233. Conservation Biology.** [Formerly BSCI 233] Ecological, evolutionary, social, and economic aspects of biodiversity loss and ecosystem disruption due to human activities. Climate change, habitat fragmentation, species overexploitation, and invasive species. Sustainable development, habitat restoration, and species reintroduction. Prerequisite: 1511. [3] (MNS)

**BSCI 3234. Microbiology.** [Formerly BSCI 234] Microorganisms, including bacteria, viruses, and mobile genetic elements. The origins and universality of microbial life, modes of genome evolution, symbioses between microbes and animals, biotechnology, and human microbiome. Prerequisite: 1511. [3] (MNS)

**BSCI 3236. Parasitology.** [Formerly BSCI 236] Biology and epidemiology of eukaryotic parasites of medical and veterinary significance. Diagnosis, treatment, and control of parasitic protists, platyhelminthes, nematodes, and arthropods. Impact on global health. Prerequisite: 1511. [3] (MNS)

**BSCI 3239. Evolution of Behavior.** [Formerly BSCI 239] Theoretical and empirical research on the evolution of behavior. Evolutionary approaches to the study of animal behavior, including the role of behavior in foraging, competition, predator-prey interactions, and sociality. Behavioral adaptations and their roles in sexual selection, mating systems, and animal communication. Prerequisite: 1511 and 2205. [3] (MNS)

**BSCI 3243. Genetics of Disease.** [Formerly BSCI 243] Application of genetics, cell biology, and molecular biology to the study of human diseases. Genomics, gene mapping, and molecular techniques. Animal models of disease. Chromosomal abnormalities, single-gene and multifactorial diseases, and epigenetics. Prerequisite: 2210. [3] (MNS)

**BSCI 3245. Biology of Cancer.** [Formerly BSCI 245] Application of cell biology, molecular biology, and genetics to the study of cancer. Tumorigenesis; cellular oncogenes; growth factor signaling; tumor suppressor genes; apoptosis; metastasis and invasion. Prerequisite: 1511. [3] (MNS)

**BSCI 3247. Molecular Evolution.** [Formerly BSCI 247] The theory of evolution at the molecular level. The evolution of DNA and RNA sequences, proteins, and genome structures will be studied using models from population genetics and comparative approaches. Molecular clocks, the evolution of gene regulation and globin genes, molecular phylogeny, and human evolution. Prerequisite: 2210 and 2205. [3] (MNS)

**BSCI 3252. Cellular Neurobiology.** [Formerly BSCI 252] Structure and function of nerve cells. Emphasis on electrical excitability, synaptic transmission, and sensory transduction. Cellular mechanisms underlying simple behaviors, sensory information processing, and learning and memory. Prerequisite: 1511. [3] (MNS)

**BSCI 3254. Neurobiology of Behavior.** [Formerly BSCI 254] Nerve cell interactions in neuronal networks of the central nervous system of animals and their impact for regulating behavior. Sensory systems, sensory-motor integration, central processing of information, neuronal-hormonal interactions; and brain anatomy and organization in invertebrates and vertebrates. Prerequisite: BSCI 1511 or NSC 2201. [3] (MNS)

**BSCI 3256. Molecules of the Brain.** [Formerly BSCI 256] Molecules of neural wiring, involving cell identity, pathfinding, synaptogenesis. Molecules of nerve cell communication, with relationship to drugs of addiction and abuse. Molecules of nervous system plasticity, and the mechanistic bases of learning and memory. Relation of these mechanisms to causes of human neurological diseases. Prerequisite: 1511. [3] (MNS)

**BSCI 3258. Vertebrate Physiology.** [Formerly BSCI 258] Fundamental mechanisms of the major vertebrate physiological systems with an emphasis on humans. Special physiological adaptations of vertebrates to their environment (respiration of aquatic animals, birds, and deep diving mammals; salt balance in fresh and saltwater environments; altitude adaptation). Prerequisite: 2201 or 2520. [3] (MNS)

**BSCI 3270. Statistical Methods in Biology.** [Formerly BSCI 270] An introduction to statistical methods used in the analysis of biological experiments, including the application of computer software packages. Emphasis on testing of hypotheses and experimental design. Topics include descriptive statistics, analysis of variance, regression, correlation, contingency analysis, and the testing of methods for sampling natural populations. Prerequisite: 1511. [3] (MNS)

**BSCI 3272. Genome Science.** [Formerly BSCI 272] Aims and importance of the science. Retrieval of genome data from public databases; experimental and computational methods used in analysis of genome data and their annotation. Functional aspects of genomics, transcriptomics, and proteomics; use of phylogenetics and population genomics to infer evolutionary relationships and mechanisms of genome evolution. Prerequisites: 1511. [3] (MNS)

**BSCI 3850. Independent Reading.** [Formerly BSCI 282] Reading and discussion of research papers with a member of the faculty. Prerequisite: consent of Biological Sciences 3850 coordinator before the end of the previous semester. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1; maximum of 2 credits total for all semesters of BSCI 3850] (No AXLE credit)

**BSCI 3860. Introduction to Research.** [Formerly BSCI 280] Work in the laboratory of a member of the Biological Sciences faculty. Term paper required. Consent of course coordinator and enrollment by arrangement before the end of the previous semester is required. Prerequisite: 1510. Prerequisite or corequisite: 1511. [1] (No AXLE credit)

**BSCI 3861. Directed Laboratory Research.** [Formerly BSCI 283] Directed student research on a project conceived by a member of the Biological Sciences faculty. Enrollment by arrangement before the end of the previous semester. May be taken only once, and participants ordinarily expected to have overall grade point average of B or better. Offered on a graded basis only. Prerequisite: 1511, one intermediate BSCI course ap-

propriate to the major or 3860, and consent of Biological Sciences 3861 coordinator. [2-4] (No AXLE credit)

**BSCI 3890. Special Topics in Biological Sciences.** [Formerly BSCI 290] Topics vary. May be repeated for credit more than once by permission of the director of undergraduate studies. Students may enroll in more than one section of this course each semester. Prerequisite: 1511. [3] (MNS)

**BSCI 3961. Independent Laboratory Research.** [Formerly BSCI 286] Original student research on a defined problem in Biological Sciences and under the supervision of Biological Sciences faculty. Some independence in the design and execution of the problem. Enrollment by arrangement before the end of the previous semester. Prerequisite: 3861, consent of Biological Sciences 3961 coordinator, cumulative grade point average of B. May be repeated for credit more than once, but students may earn only up to 6 credits per semester of enrollment. [2-6] (No AXLE credit)

**BSCI 3965. Undergraduate Seminar.** [Formerly BSCI 275] Discussions and papers based on readings in research journals. Topics vary. Prerequisite: fulfillment of the intermediate course requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but only two hours may count toward the major. Students may enroll in more than one section of this course each semester. [2] (No AXLE credit)

**BSCI 4265. Nucleic Acid Transactions.** [Formerly BSCI 265] Biochemistry of the expression, transmission, and maintenance of genetic information. DNA transcription, replication, recombination, and repair. Structural mechanisms and biological functions of DNA processing proteins. Offered on a graded basis only. Prerequisite: 2520. [3] (MNS)

**BSCI 4266. Advanced Molecular Genetics.** [Formerly BSCI 266] Principles of classical and molecular genetic analysis: mutation and recombination, mapping, and the application of genetic methodology to the study of complex systems. Special emphasis on modern genomic approaches. Prerequisite: 2210. [3] (MNS)

**BSCI 4999. Honors Research.** [Formerly BSCI 296] Open only to majors in the Honors Program. May be repeated for credit more than once, but students may earn only up to 6 credits per semester of enrollment. [4-6] (No AXLE credit)

## Catalan

**CTLN 1103. Intensive Elementary Catalan.** [Formerly CTLN 102] Romance tongue of northeastern Spain, Andorra, and southwestern France. Emphasis on oral communication, grammar, reading, and culture. Prior study of another Romance language through the intermediate level is expected. No credit for students who have earned credit for a higher level Catalan language course. [3] (INT)

## Chemistry

**CHEM 1001. Commons Seminar.** [Formerly CHEM 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

**CHEM 1010. Introductory Chemistry.** [Formerly CHEM 101A] General principles for non-science majors or those not planning on taking additional chemistry courses. The periodic table, chemical reactions, properties of solutions, and atmospheric chemistry with connections to global environmental issues. No prior chemistry experience required. Not a prerequisite for advanced courses in chemistry. No credit for students who have earned credit for 1601, 2211, or 2221. [3] (MNS)

**CHEM 1010L. Introductory Chemistry Laboratory.** [Formerly CHEM 100A] Laboratory to accompany 1010. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1010. No credit for students who have earned credit for 1601L or 2221L. Corequisite: 1010. [1] (No AXLE credit)

**CHEM 1020. Introductory Chemistry.** [Formerly CHEM 101B] General principles for non-science majors or those not planning on taking additional chemistry courses. Chemistry of water, basic nuclear chemistry, organic and biochemistry, with discussion of the chemistry of common medicines and nutritional chemistry. No prior chemistry experience required. Not a

prerequisite for advanced courses in chemistry. No credit for students who have earned credit for 1602, 2212, or 2222. [3] (MNS)

**CHEM 1020L. Introductory Chemistry Laboratory.** [Formerly CHEM 100B] Laboratory to accompany 1020. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1020. No credit for students who have earned credit for 1602L or 2222L. Corequisite: 1020. [1] (No AXLE credit)

**CHEM 1111. First-Year Writing Seminar.** [Formerly CHEM 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**CHEM 1601. General Chemistry.** [Formerly CHEM 102A] General principles of chemistry for science and engineering students. Composition and structure of matter, chemical reactions, bonding, solution chemistry, and kinetics. Thermodynamics, equilibrium, acids and bases, electrochemistry, and coordination compounds. Three lectures per week and a recitation period. Students who have earned credit for 1010 will forfeit credit for 1010 upon completion of this course. Corequisite: 1601L. [3] (MNS)

**CHEM 1601L. General Chemistry Laboratory.** [Formerly CHEM 104A] Laboratory to accompany 1601. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1601. Students who have earned credit for 1010L will forfeit credit for 1010L upon completion of this course. Prerequisite or corequisite: 1601. [1] (No AXLE credit)

**CHEM 1602. General Chemistry.** [Formerly CHEM 102B] Continuation of 1601. General principles of chemistry for science and engineering students. Composition and structure of matter, chemical reactions, bonding, solution chemistry, and kinetics. Thermodynamics, equilibrium, acids and bases, electrochemistry, and coordination compounds. Three lectures per week and a recitation period. Students who have earned credit for 1020 will forfeit credit for 1020 upon completion of this course. Prerequisite: 1601. Corequisite: 1602L. [3] (MNS)

**CHEM 1602L. General Chemistry Laboratory.** [Formerly CHEM 104B] Laboratory to accompany 1602. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1602. Students who have earned credit for 1020L will forfeit credit for 1020L upon completion of this course. Prerequisite: 1601L. Corequisite: 1602. [1] (No AXLE credit)

**CHEM 2100. Introduction to Analytical Chemistry.** [Formerly CHEM 210] Fundamental quantitative analytical chemistry with emphasis on principles of analysis, separations, equilibria, stoichiometry and spectrophotometry. No credit for graduate students in chemistry. Corequisite: 2100L. [3] (MNS)

**CHEM 2100L. Analytical Chemistry Laboratory.** [Formerly CHEM 212A] Laboratory to accompany Chemistry 2100. No credit for graduate students in chemistry. One four-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 2100. Prerequisite or corequisite: 2100. [1] (No AXLE credit)

**CHEM 2211. Organic Chemistry for Advanced Placement Students.** [Formerly CHEM 218A] Fundamental types of organic compounds; their nomenclature, classification, preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Equivalent to 2221. No credit for students who have earned credit for 2221 or 2222. Prerequisite: enrollment limited to first-year students with advanced placement chemistry scores of 5, or the approval of the director of undergraduate studies. Corequisite: 2221L. [3] (MNS)

**CHEM 2212. Organic Chemistry for Advanced Placement Students.** [Formerly CHEM 218B] Continuation of 2211. Fundamental types of organic compounds; their nomenclature, classification, preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Equivalent to 2222. No credit for students who have earned credit for 2221 or 2222. Prerequisite: enrollment limited to first-year

students with advanced placement chemistry scores of 5, or the approval of the director of undergraduate studies. Corequisite: 2222L. [3] (MNS)

**CHEM 2221. Organic Chemistry.** [Formerly CHEM 220A] Fundamental types of organic compounds. Nomenclature and classification. Preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Serves as repeat credit for 2211. No credit for graduate students in chemistry. Prerequisite: 1602. Corequisite: 2221L. [3] (MNS)

**CHEM 2221L. Organic Chemistry Laboratory.** [Formerly CHEM 219A] Laboratory to accompany 2211 or 2221. One four-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 2211 or 2221. Prerequisite or corequisite: 2211 or 2221. [1] (No AXLE credit)

**CHEM 2222. Organic Chemistry.** [Formerly CHEM 220B] Continuation of 2221. Fundamental types of organic compounds. Nomenclature and classification. Preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Serves as repeat credit for 2212. No credit for graduate students in chemistry. Prerequisite: 2221. Corequisite: 2222L. [3] (MNS)

**CHEM 2222L. Organic Chemistry Laboratory.** [Formerly CHEM 219B] Laboratory to accompany 2212 or 2222. One four-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 2212 or 2222. Prerequisite or corequisite: 2212 or 2222. [1] (No AXLE credit)

**CHEM 2610. Introduction to Nanochemistry.** [Formerly CHEM 240] Synthesis, characterization, and assembly of nanoscale materials. No credit for graduate students in chemistry. Prerequisite: 1602. [3] (MNS)

**CHEM 3010. Inorganic Chemistry.** [Formerly CHEM 203] A survey of modern inorganic chemistry including coordination compounds and the compounds of the main-group elements. Representative reactions and current theories are treated. Prerequisite or corequisite: 3300 or 3310. [3] (MNS)

**CHEM 3020. Introduction to Bioinorganic Chemistry.** [Formerly CHEM 202] Functions of inorganic elements in living cells. The manner in which coordination can modify the properties of metallic ions in living systems. Prerequisite: 2212 or 2222. [3] (MNS)

**CHEM 3120. Instrumental Analytical Chemistry.** [Formerly CHEM 211] Chemical and physical principles of modern analytical chemistry instrumentation. Prerequisite: 2100 and either 2212 or 2222. [3] (MNS)

**CHEM 3135W. Forensic Analytical Chemistry.** [Formerly CHEM 227W] Techniques, methodologies, data collection, and interpretation. Laboratory experience with drug analysis, toxicology, trace, and arson analysis. Two hours of lecture and one four-hour laboratory per week. Prerequisite: 2100 and 2100L. [3] (MNS)

**CHEM 3220. Spectroscopic Identification of Organic Compounds.** [Formerly CHEM 225] Theoretical and practical aspects of spectroscopic methods, with an emphasis on NMR spectroscopy, for structural characterization of organic compounds. Prerequisite: 2212 or 2222. [3] (MNS)

**CHEM 3300. Physical Chemistry: Quantum Mechanics, Spectroscopy, and Kinetics.** [Formerly CHEM 230] Chemical kinetics and principles of quantum chemistry applied to molecular structure, bonding, and spectroscopy. Prior study of multivariable calculus is expected. No credit for graduate students in chemistry. Prerequisite or corequisite: PHYS 1501, 1601, or 1901. Prerequisite: MATH 1201 or 1301. [3] (MNS)

**CHEM 3310. Biophysical Chemistry: Thermodynamics in Chemical and Biological Systems.** [Formerly CHEM 231] Chemical thermodynamics and equilibrium, their statistical foundation, and applications to chemical and biological phenomena in biomedical research. Prerequisite or corequisite: PHYS 1501, 1601, or 1901. Prerequisite: MATH 1201 or 1301. [3] (MNS)

**CHEM 3315. Physical Chemistry Laboratory.** [Formerly CHEM 236] Experiments in chemical thermodynamics and kinetics. Data analysis and presentation. No credit for graduate students in chemistry. One three-hour laboratory or one lecture per week. Calculus through Math 2300 recom-

mended. Prerequisite: 2222L and either MATH 1201 or 1301. [1] (No AXLE credit)

**CHEM 3600. Chemical Literature.** [Formerly CHEM 250] Assigned readings and problems in the nature and use of the chemical literature. Prerequisite: 2212 or 2222. [1] (No AXLE credit)

**CHEM 3630. Macromolecular Chemistry: Polymers, Dendrimers, and Surface Modifications.** [Formerly CHEM 235] Synthesis and characterization of macromolecular materials including linear, branched, dendrimetric, and star polymers. Mechanical and physiochemical properties of polymeric types. Kinetics of living polymerization. Applications to nanostructures, templates, and advanced devices. Prerequisite: 1602. [3] (MNS)

**CHEM 3710. Bioorganic Chemistry.** [Formerly CHEM 224] Essential metabolites including vitamins, steroids, peptides, and nucleotides. Consideration of phosphate esters and the synthesis of oligodeoxynucleotides. Three lectures per week. Prerequisite: 2212 or 2222. [3] (MNS)

**CHEM 3841. Readings for Honors.** [Formerly CHEM 291A] Open only to students in the departmental honors program. General reading supervised by research adviser. [2] (No AXLE credit)

**CHEM 3842. Readings for Honors.** [Formerly CHEM 291B] Open only to students in the departmental honors program. Continuation of 3841, with emphasis on research planned. [2] (No AXLE credit)

**CHEM 3860. Undergraduate Research.** [Formerly CHEM 282] Open to students who have earned at least 8 hours of credit and a minimum GPA of 2.7 in chemistry, with consent of the director of undergraduate studies and the sponsoring faculty member. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**CHEM 3980. Honors Research.** [Formerly CHEM 292A] Open only to students in the departmental honors program. Original research supervised by research adviser, to be reported in thesis form with oral examination thereon. [2] (No AXLE credit)

**CHEM 4050. Introduction to Organometallic Chemistry.** [Formerly CHEM 207] A general description of the preparation, reaction chemistry, molecular structure, bonding, and spectroscopic identification of organometallic compounds of the transition metals. Prerequisite: 3010. [3] (MNS)

**CHEM 4210. Organic Chemistry Structure and Mechanism.** [Formerly CHEM 220C] Stereochemistry and conformational analysis; mechanisms of organic reactions; linear free-energy relationships; reactive intermediates. Three lectures and one recitation hour per week. No credit for students who have earned credit for 5210. Students who have earned credit for 5209 will earn only two credits for this course. Prerequisite: either 2212 or 2222 and either 3300 or 3311. [4] (MNS)

**CHEM 4230. Physical Organic Chemistry.** [Formerly CHEM 222] Structure and bonding in organic molecules. Reactive intermediates and organic reaction mechanisms. Prerequisite: 4210. [3] (MNS)

**CHEM 4240. Advanced Organic Reactions.** [Formerly CHEM 223] A comprehensive study of organic reactions and their application to the preparation of small molecules. Prerequisite: 4210. Three lectures per week. [3] (MNS)

**CHEM 4720. Drug Design and Development.** [Formerly CHEM 226] Concepts of drug design; physical chemistry of drug interactions with receptors, enzymes, and DNA; drug absorption and distribution. Organic chemistry of drug metabolism; mechanism of action for selected therapeutic classes. Prerequisite: 3710 or BSCI 2520. [3] (MNS)

**CHEM 4965. Advanced Integrated Laboratory.** [Formerly CHEM 295A] Multidisciplinary laboratory projects. Experimental design, synthetic techniques, chemical analysis, spectroscopy, and computational methods. Offered on a graded basis only. Limited to senior majors. Prerequisite: 2100, 2100L. [3] (No AXLE credit)

**CHEM 4966. Advanced Integrated Laboratory.** [Formerly CHEM 295B] Continuation of 4965. Offered on a graded basis only. Limited to senior majors. Prerequisite: 4965. [3] (No AXLE credit)

**CHEM 4980. Honors Research.** [Formerly CHEM 292B] Open only to students in the departmental honors program. Original research super-

vised by research adviser, to be reported in thesis form with oral examination thereon. [2] (No AXLE credit)

**CHEM 4999. Honors Research.** [Formerly CHEM 292C] Open only to students in the departmental honors program. Original research supervised by research adviser, to be reported in thesis form with oral examination thereon. [2] (No AXLE credit)

## Chinese

**CHIN 1011. Basic Chinese.** [Formerly CHIN 200A] Designed exclusively for students with no previous exposure to the language. The basic pronunciation, grammar, and writing system of Mandarin Chinese. Simple conversation, the pinyin Romanization system, basic Chinese characters, and cultural elements embedded in the language. No credit for students who have earned credit for 1101 or a more advanced Chinese language course. [3] (No AXLE credit)

**CHIN 1012. Basic Chinese.** [Formerly CHIN 200B] Continuation of 1011. No credit for students who have earned credit for 1101 or a more advanced Chinese language course. Prerequisite: 1011. [3] (No AXLE credit)

**CHIN 1101. Elementary Chinese I.** [Formerly CHIN 201] Introduction to Modern Chinese pronunciation, grammar, conversation, reading, and writing. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for 1012 or a more advanced Chinese language course. [5] (No AXLE credit)

**CHIN 1102. Elementary Chinese II.** [Formerly CHIN 202] Continuation of 1101. Introduction to Modern Chinese pronunciation, grammar, conversation, reading, and writing. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 1012 or 1101. [5] (INT)

**CHIN 1231. Calligraphy.** [Formerly CHIN 231] Basic skills of writing standard script kaishu. Basic aesthetic of Chinese calligraphy. No Chinese language background necessary. [1] (No AXLE credit)

**CHIN 2201. Intermediate Chinese I.** [Formerly CHIN 211] Oral and written language training. Two hours of lecture and three hours of drill per week. Repeat credit for students who completed 214. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 1102. [5] (INT)

**CHIN 2202. Intermediate Chinese II.** [Formerly CHIN 212] Continuation of 2201. Language training in oral and written Chinese. Two hours of lecture and three hours of drill per week. Serves as repeat credit for 216. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 2201. [5] (INT)

**CHIN 2211. Chinese for Heritage Learners I.** [Formerly CHIN 225] Intended for students who have some informal training in listening and speaking Mandarin Chinese. Basic literacy and other aspects of language proficiency. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Chinese language course. [3] (INT)

**CHIN 2212. Chinese for Heritage Learners II.** [Formerly CHIN 226] Continuation of 2211. Intended for students who have some informal training in listening and speaking Mandarin Chinese. Basic literacy and other aspects of language proficiency. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 2211. [3] (INT)

**CHIN 3301. Advanced Chinese I.** [Formerly CHIN 241] Readings in Chinese culture to enhance proficiency in oral and written Chinese. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 2202. [3] (INT)

**CHIN 3302. Advanced Chinese II.** [Formerly CHIN 242] Continuation of 3301. Readings in Chinese culture to enhance proficiency in oral and written Chinese. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 3301. [3] (INT)

**CHIN 3302W. Advanced Chinese II.** [Formerly CHIN 242W] Reading and writing essays about modern Chinese culture and society. Repeat credit for 3302. No credit for students who have earned credit for a more

advanced Chinese language course. Graded basis only. Prerequisite: 3301. [3] (INT)

**CHIN 3851. Independent Study.** [Formerly CHIN 289A] Designed primarily for majors who want to study Chinese not regularly offered in the curriculum. Must have consent of instructor. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum 12 credits total for all semesters of CHIN 3851 and 3852] (No AXLE credit)

**CHIN 3852. Independent Study.** [Formerly CHIN 289B] Designed primarily for majors who want to study Chinese not regularly offered in the curriculum. Must have consent of instructor. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum 12 credits total for all semesters of CHIN 3851 and 3852] (No AXLE credit)

**CHIN 4401. Business Chinese I.** [Formerly CHIN 255] Language skills for listening, speaking, reading, and writing in business environments. Modern China from economic and business perspectives. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 3302 or 3302W. [3] (INT)

**CHIN 4402. Business Chinese II.** [Formerly CHIN 256] Continuation of 4401. Language skills for listening, speaking, reading, and writing in business environments. Modern China from economic and business perspectives. Prerequisite: 4401. [3] (INT)

**CHIN 4403. Readings in Modern Chinese Media.** [Formerly CHIN 251] Books, newspapers, Internet, and television documents and productions pertaining to political, social, and economic issues in China, including foreign trade-related issues. Prerequisite: 3302 or 3302W. [3] (INT)

**CHIN 4404. Readings in Modern Chinese Media.** [Formerly CHIN 252] Continuation of 4403. Books, newspapers, and Internet sources pertaining to political, social, and cultural issues. Prerequisite: 3302 or 3302W. [3] (INT)

**CHIN 4405. Classical Chinese Literature and Philosophy.** [Formerly CHIN 253] Classical writings by Confucius, Sunzi, and Zhuangzi. Poems by Li Bai and Du Fu. Excerpts from *The Dream of the Red Chamber*. Linguistic comparisons between classical and modern Chinese. Prerequisite: 3302 or 3302W. [3] (INT)

**CHIN 4406. Readings in Modern Literary Chinese.** [Formerly CHIN 254] 1910 to the present. Chinese literature and poetry. Linguistic transformations that produced modern literary Chinese. Prerequisite: 3302 or 3302W. [3] (INT)

## Cinema and Media Arts

**CMA 1001. Commons Seminar.** [Formerly CMA 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**CMA 1002W. Moving Images and Analytical Thinking.** Moving images and new media from various genres, periods, and national contexts. May be repeated for credit once if there is no duplication in topic. Offered on a graded basis only. [3] (HCA)

**CMA 1111. First-Year Writing Seminar.** [Formerly CMA 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**CMA 1500. Fundamentals of Film and Video Production.** [Formerly CMA 105] Technologies and techniques of filmmaking. Digital video cameras, staging and lighting, sound recording, post-production sound, and image editing. Offered on a graded basis only. [3] (No AXLE credit)

**CMA 1600. Introduction to Film and Media Studies.** [Formerly CMA 125] Stylistic tendencies and narrative strategies, genres, and theoretical

approaches. Live-action cinema, animation, experimental cinema, television, and computer-generated moving images. [3] (HCA)

**CMA 2100. Intermediate Filmmaking: Alternate Forms.** [Formerly CMA 175] Topics vary. Motion picture production and analysis of nonfiction and experimental forms. Development of conceptual and technical skills for making individual and collaborative film projects. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Offered on a graded basis only. Prerequisite: 1500. [3] (No AXLE credit)

**CMA 2200. Intermediate Filmmaking: The Fiction Film.** [Formerly CMA 176] Topics vary. Motion picture production and analysis of the fiction form and cinematic storytelling. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Offered on a graded basis only. Prerequisite: 1500. [3] (No AXLE credit)

**CMA 2300. Film and Media Theory.** [Formerly CMA 201] Historical overview of the major analytical and critical approaches to the study of film as an aesthetic and cultural form. Contemporary perspectives on cinema, video, and new media. Prerequisite: 1600. [3] (P)

**CMA 2400. History of World Cinema.** [Formerly CMA 211] Survey of world film history from 1895 to the present. Key films and filmmakers. Historical, aesthetic, national, and political contexts of films and film movements. No credit for students who have earned credit for HART 272a or 272b. Prerequisite: 1600. [3] (HCA)

**CMA 2500W. Screenwriting.** [Formerly CMA 227W] Techniques of screenwriting. Serves as repeat credit for students who have completed THTR 227, 227W. [3] (HCA)

**CMA 2600W. Advanced Screenwriting.** [Formerly FILM 275W] Story structure, character development, and dialogue. Serves as repeat credit for THTR 275 and 275W. Prerequisite: 2500W or THTR 227W. [3] (HCA)

**CMA 3850. Independent Study.** [Formerly CMA 289A] Projects are arranged with individual professors and must be confirmed by the director of Cinema and Media Arts within two weeks of the beginning of classes; otherwise the student will be dropped from the rolls. [Variable credit: 1-3 each semester. Limit of 6 hours for 3850 and 3851 combined for majors.] (No AXLE credit)

**CMA 3851. Independent Study.** [Formerly FILM 289B] Projects are arranged with individual professors and must be confirmed by the director of Cinema and Media Arts within two weeks of the beginning of classes; otherwise the student will be dropped from the rolls. [Variable credit: 1-3 each semester. Limit of 6 hours for 3850 and 3851 combined for majors.] (No AXLE credit)

**CMA 3880. Internship Training.** [Formerly CMA 280B] Under faculty supervision, students from any discipline can gain experience working on projects related to film and media in public or private organizations. Responsibilities include conducting background research and developing skills in film and media study and production. Hours for background readings and research will be completed in CMA 3881 concurrently with 3880. Normally a 2.90 grade point average, 6 hours of prior work in Cinema and Media Arts, and approval of the student's plan by the director of undergraduate studies are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 will not count toward the Film Studies Major or minor. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

**CMA 3881. Internship Readings and Research.** [Formerly CMA 280A] Under faculty supervision, students from any discipline can gain experience working on projects related to film and media in public or private organizations. Responsibilities include conducting background research and developing skills in film and media study and production. Hours for background readings and research will be completed in CMA 3881 concurrently with CMA 3880. Normally a 2.90 grade point average, 6 hours of prior work in Cinema and Media Arts, and approval of the student's plan by the director of undergraduate studies are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Readings and research conducted under

the supervision of a member of the Cinema and Media Arts program and a substantial research paper or written project (such as a screenplay, treatment, or production plan related to the Training component) is required. Corequisite: 3880. [Variable credit: 1-6] (No AXLE credit)

**CMA 3891. Special Topics in Film and Video Production.** [Formerly CMA 288A] Topics vary. May be repeated more than once if there is no duplication of topic. Prerequisite: 1500. [3] (No AXLE credit)

**CMA 3892. Special Topics in the Study of Film.** [Formerly CMA 288B] Topics vary. May be repeated more than once if there is no duplication of topic. Prerequisite: 1600. [3] (No AXLE credit)

**CMA 4961. Senior Seminar on Criticism, Theory, and History.** [Formerly CMA 290A] Advanced reading and research in film. Offered on a graded basis only. Prerequisite: 1600 and senior standing. [3] (No AXLE credit)

**CMA 4962. Senior Seminar on Film Practice.** [Formerly CMA 290B] Advanced independent filmmaking, portfolio assembly, and professionalism. Offered on a graded basis only. Prerequisite: 1500 and senior standing. [3] (No AXLE credit)

**CMA 4998. Senior Honors Research.** [Formerly CMA 299A] Acquisition, reading, and analysis of primary source research material. Open only to senior honor students. [3] (No AXLE credit)

**CMA 4999. Senior Honors Thesis.** [Formerly CMA 299B] Writing a thesis under the supervision of the thesis advisor. Open only to senior honor students. Prerequisite: 4998. [3] (No AXLE credit)

## Classics

**CLAS 1001. Commons Seminar.** [Formerly CLAS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**CLAS 1111. First-Year Writing Seminar.** [Formerly CLAS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**CLAS 1120. Greek Civilization.** [Formerly CLAS 130] A survey of the history and achievements of Greece from its Mycenaean origins to the Roman domination. Topics include literature, art, athletics, Periclean Athens, the conquest of Alexander, and the Hellenistic age. [3] (INT)

**CLAS 1130. The Greek Myths.** [Formerly CLAS 150] A study of the nature of the Greek myths, with consideration of the related Near Eastern myths and the early history of myths in Greece. Both the divine and the heroic myths, with some attention to the development of these myths in Italy and to their influence upon art and literature. [3] (HCA)

**CLAS 1150. Roman Civilization.** [Formerly CLAS 146] Ancient Roman civilization from mythical foundations to the fall of the empire. A historical survey of topics including art and architecture, city life, agriculture, religion, law, slavery, public entertainment, and literature. [3] (INT)

**CLAS 2100. History of the Ancient Near East.** [Formerly CLAS 207] From the neolithic period to the conquests of Alexander the Great, in the geographical area from Persia to Troy and Egypt. Special attention to the history of Israel. [3] (INT)

**CLAS 2110. History of Greece to Alexander the Great.** [Formerly CLAS 208] The Greek world from the beginning of the Mycenaean Age (1650 B.C.) to the end of the Classical period. Special attention to the relationship between political history and the development of Hellenism. [3] (INT)

**CLAS 2120. Greece and the Near East from Alexander to Constantine.** [Formerly CLAS 209] From Alexander's conquest of the Persian Empire to the ascendancy of Christianity in the fourth century. Social, cultural, and religious transformations within the framework of political history. [3] (INT)

**CLAS 2150. History of the Roman Republic.** [Formerly CLAS 212] The growth and evolution of the Roman world, from the foundation of the city in the seventh century B.C. to the reign of Caesar Augustus. The Romans' unification of Italy, conquest of the Mediterranean and western Europe, adoption of Hellenism, and overthrow of the Republic. [3] (INT)

**CLAS 2160. History of the Roman Empire.** [Formerly CLAS 213] The Roman world from Augustus to the collapse of the western empire in the fifth century. Political, military, social, and religious history. Special attention given to problems arising from use of the primary sources as well as to controversies in modern scholarship. [3] (INT)

**CLAS 2180. The Mediterranean World from Late Antiquity to the Middle Ages.** [Formerly CLAS 223] Eastern Roman Empire from Constantine to Arab conquests. Political, social, cultural, and religious history, including monasticism, barbarian invasions, changing roles of Emperor and Church, and birth of Islam. Developments in urban life and landscape. [3] (INT)

**CLAS 2200. Archaic and Classical Greek Art and Architecture, 1000 to 400 B.C.E..** [Formerly CLAS 204] Sculpture, vase painting, architecture, and the minor arts. Formal and stylistic developments in relation to changing cultural background. No credit for students who have earned credit for HART 2220. Repeat credit for students who have completed HART 257. [3] (HCA)

**CLAS 2210. Late Classical Greek and Hellenistic Art and Architecture.** [Formerly CLAS 205] Sculpture, vase painting, architecture, and the minor arts from after the Parthenon to the Roman Empire. Media that developed significantly in this period, such as wall painting and mosaic. No credit for students who have earned credit for HART 2220. Repeat credit for students who have completed HART 258. [3] (HCA)

**CLAS 2250. Roman Art and Architecture.** [Formerly CLAS 206] Sculpture, architecture, and painting from the tenth century B.C.E. to the early fourth century C.E. Daily life of the Romans as seen in excavations of the towns of Pompeii and Herculaneum. [3] (HCA)

**CLAS 3000. Classical Tradition in America.** [Formerly CLAS 222] Influences of classical Greece and Rome on the literature, politics, architecture, and values of the United States from the colonial period to the present. [3] (US)

**CLAS 3010. The Ancient Origins of Religious Conflict in the Middle East.** [Formerly CLAS 224] Religious oppositions in the eastern Mediterranean world from the Maccabean revolt to the Muslim conquests of the seventh century; beginnings of religious militancy; challenges of monotheism to Greco-Roman civilization; conversion, persecution, and concepts of heresy and holy war in Christianity, Judaism, and Islam. [3] (P)

**CLAS 3030. Death, Disease, and Health in the Ancient World.** From the Bronze Age to early Christianity and Late Antiquity. Biological history of the Greeks, Romans, and other Mediterranean peoples. Changing concepts of death and afterlife; interpretations of disease; medical thought and practice. Healing, epidemics, natural catastrophe, and dietary variation. Evidence from classical literature, archaeology, bones and teeth. [3] (SBS)

**CLAS 3100. Women, Sexuality, and the Family in Ancient Greece and Rome.** [Formerly CLAS 220] The status and role of women, law and the regulation of the private sphere, sexuality and gender roles, demography and family structure, marriage, children, religion, domestic architecture and the household economy, ancient critiques of the family, and the impact of Christianity. [3] (SBS)

**CLAS 3110. Warfare in the Ancient Mediterranean.** [Formerly CLAS 226] Continuity and change in ancient Greek and Roman warfare 800 B.C. to A.D. 120. Social, political, and religious aspects of war. Effects of war, imperialism, and militarism on internal and external populations. [3] (INT)

**CLAS 3120. Humor, Ancient to Modern.** [Formerly CLAS 225] Ancient comic forms juxtaposed with modern theories of humor. Aristophanic Old Comedy, New Comedy, and Satire. Modern parallels. [3] (HCA)

**CLAS 3150. Roman Law.** [Formerly CLAS 260] The relationship between law and society as illustrated by cases drawn from Roman legal and literary

sources. The development of legal reasoning and the rise of an autonomous legal profession at Rome. [3] (SBS)

**CLAS 3160. Roman Law and Social History.** Relationship of law and society as illustrated by legal, literary, epigraphic, and papyrological evidence. Views and methodologies of leading modern scholars. Focus on methodology. Marriage, family, personal status, the economy, and judicial system. Basic familiarity with Roman history or law is expected. [3] (SBS)

**CLAS 3190W. Augustan Rome.** [Formerly CLAS 296W] Social, administrative, religious, and military reforms. Common themes in art, architecture, and literature; changes in national identity in the transition from Republic to Empire. Prerequisite: 1150, 2150, or 2160. [3] (HCA)

**CLAS 3200. The Greek City.** [Formerly CLAS 211] The example of ancient Athens. The stoa, the theatre, the house, and fortifications. Institutions such as the courts, the public assembly, and the family. Literary, historical, archaeological, and philosophical sources. Serves as repeat credit for students who have completed HART 263. [3] (SBS)

**CLAS 3210. The Archaeology of Greek Sanctuaries.** [Formerly CLAS 245] Study of ancient Greek religious worship through an examination of temples, altars, cult images, votives, priests, and processions. Panhellenic sanctuaries and oracular and mystery cults. No credit for students who have earned credit for 3700. [3] (INT)

**CLAS 3220. The Trojan War in History, Art, and Literature.** [Formerly CLAS 240] Representations in Classical Greek art, literature, and archaeological evidence. The composition of the Homeric epics; the meaning of the Trojan War to later audiences. [3] (HCA)

**CLAS 3230. Alexander the Great.** [Formerly CLAS 243] Alexander's rise to power and conquests in Europe, Asia, and Africa; the legacy of his introduction of Greek culture to the East; his significance to later audiences. Offered on a graded basis only. [3] (HCA)

**CLAS 3300. Akkadian.** [Formerly CLAS 231] Introduction to the cuneiform script and to the grammar of Akkadian, the language of ancient Mesopotamia. Selected readings in Old Babylonian (CODEX Hammurabi, Mari letters) and Neo-Assyrian texts (Creation Poem, Gilgamesh Epic). [3] (INT)

**CLAS 3301. Akkadian.** [Formerly CLAS 232] Continuation of 3300. Introduction to the cuneiform script and to the grammar of Akkadian, the language of ancient Mesopotamia. Selected readings in Old Babylonian (CODEX Hammurabi, Mari letters) and Neo-Assyrian texts (Creation Poem, Gilgamesh Epic). [3] (INT)

**CLAS 3310. Culture of the Ancient Near East.** [Formerly CLAS 236] A survey of highly sophisticated Near East cultures of the last three millennia before the common era (B.C.). Discussion of political histories, and the social, religious, and intellectual heritage of Mesopotamia, Egypt, and Anatolia through excavated artifacts and written documents. [3] (INT)

**CLAS 3320. The Amarna Age.** [Formerly CLAS 238] The Amarna period from the sixteenth through the twelfth centuries B.C.E., as illumined by excavations of palaces and temples in Egypt, Anatolia, Canaan, and Mesopotamia as well as the vast historical, legal, and literary documents of the period. Focus on the internationalism and theological speculation of the period as seen through the powerful personalities and accomplishments of leaders such as Thutmose III, Suppiluliumas, Ramses II, and the spiritually influential Akehnaten. [3] (INT)

**CLAS 3700. Uncovering Greek Religion: Cults, Festivals, and Sanctuaries in the Ancient World.** [Formerly CLAS 241] Paganism to Judaism and early Christianity. Material culture, including architecture, sculpture, votive dedications, and topography of sanctuaries. Relationship between religion and culture. Politics, warfare, and athletics. Impact of ancient cults on modern Greece. Taught in Greece. Offered on a graded basis only. No credit for students who have earned credit for 3210. [3] (INT)

**CLAS 3710. Archaeology, History, and Culture in Greece: Kenchreai Field School.** [Formerly CLAS 242] Archaeological field school at the site of Kenchreai with seminars and excursions in southern Greece. Basic techniques in excavation, survey, and the analysis of architecture, artifacts, and bones. Explorations of churches, temples, houses, and tombs. Focus on Greece during the Roman Empire and late antiquity. Landscape

settlement, cult practice, cultural and social diversity, and funerary ritual. Offered on a graded basis only. [3] (INT)

**CLAS 3720. History and Art of Ancient Rome.** [Formerly CLAS 244] The mid-second century BCE to the mid-second century CE. Investigating significant sites, monuments, and museum collections in Rome and locations throughout southern Italy. Monumental and domestic architecture, wall paintings, sculpture, coins, and ancient sources. [3] (INT)

**CLAS 3850. Independent Study.** [Formerly CLAS 289] Completion of a substantial research paper in either classics or the classical tradition under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits for all semesters of CLAS 3850] (No AXLE credit)

**CLAS 4998. Senior Honors Thesis.** [Formerly CLAS 299A] Open only to seniors in the departmental honors program. [3] (No AXLE credit)

**CLAS 4999. Senior Honors Thesis.** [Formerly CLAS 299B] Open only to seniors in the departmental honors program. [3] (No AXLE credit)

## Communication of Science and Technology

**CSET 2100. Science Communication Tools and Techniques.** [Formerly CSET 201] Translating technical research for a general readership. Benefits and limitations of different formats, texts, and media for telling stories about science. Repeat credit for students who completed 150 in fall 2011 or fall 2012. No credit for students who earned credit for CMST 237 before fall 2013. [3] (HCA)

**CSET 3840. Directed Study.** [Formerly CSET 289] Individual research and scholarly investigation in science, engineering, or medicine. Usually conducted in a laboratory setting. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**CSET 3841. Project in Science Writing and Communicating.** [Formerly CSET 290] Presentation of scientific, engineering, or medical research, including biographical and historical background where appropriate, in one or more presentation styles (written, visual, web), under faculty supervision. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 3840 and approval of the program director. [1-3] (No AXLE credit)

**CSET 3890. Special Topics.** [Formerly CSET 150] Topics as announced. May be repeated for credit more than once if there is no duplication in topic, but students may earn only 3 credits per semester of enrollment. [3] (No AXLE credit)

**CSET 4998. Honors Thesis.** [Formerly CSET 296] Limited to students admitted to the Communication of Science and Technology Honors program. May be repeated for credit once, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 3840 and 3841. [1-3] (No AXLE credit)

## Communication Studies

**CMST 1001. Commons Seminar.** [Formerly CMST 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**CMST 1002. Introduction to Communication Studies.** Theoretical foundations and practice of human communication. Argument and advocacy; public address; and critical analysis of media and culture. [3] (HCA)

**CMST 1111. First-Year Writing Seminar.** [Formerly CMST 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)



**CMST 1500. Fundamentals of Public Speaking.** [Formerly CMST 100] Theory and practice in speaking before an audience. Problems of preparation, content, organization, language, and delivery are treated. [3] (HCA)

**CMST 1850. Interpersonal Communication.** [Formerly CMST 101] A study of both the theory and application of verbal and nonverbal communication as they occur in relatively unstructured person-to-person and small group settings. [3] (SBS)

**CMST 2100. Argumentation and Debate.** [Formerly CMST 200] A course in the practice of debate examining argumentation theory. Emphasis on forms of reasoning and use of evidence in debate. Prerequisite: 1500. [3] (HCA)

**CMST 2110. Persuasion.** [Formerly CMST 201] The theory and practice of persuasion with particular emphasis on speech composition, the use of language and its relationship to oral style, structure, and the relationship of structure to the process of speech preparation. Prerequisite: 1500. [3] (HCA)

**CMST 2120. Organizational and Managerial Communication.** [Formerly CMST 204] Theory and practice of communication in relation to organizations and management with application to leadership, values and ethics, organizational communication theory, and organizational conflict. Prerequisite: 1500. [3] (HCA)

**CMST 2800. Rhetoric and Civic Life.** [Formerly CMST 210] Public discourse and the duties and prerogatives of citizenship. Theory, models, and criticism of rhetoric and oratory in their deliberative, forensic, and epideictic settings. [3] (HCA)

**CMST 2900. Values in Modern Communication.** [Formerly CMST 223] An examination of values, explicit and implicit, in communication situations in modern American society. The course begins with the discovery and analysis of values and applies this process to technological innovation and rhetorical choice, interpersonal communication, advertising and consumerism, and mass-media persuasion. [3] (P)

**CMST 2950. Rhetoric of Mass Media.** [Formerly CMST 241] A study of the nature, effects, reasons for the effects, ethics, regulation, and criticism of contemporary mass media communication. Political causes, news reporting, commercial advertising, and similar sources of rhetoric are included. [3] (HCA)

**CMST 3000. Rhetoric of the American Experience, 1640-1865.** [Formerly CMST 220] A critical and historical examination of the methods and effects of public debate and other attempts to influence the attitudes, affective response, and behavior of the American people. Attention to the rhetorical features of selected issues and speakers from colonial times through the Civil War. [3] (US)

**CMST 3001. Rhetoric of the American Experience, 1865 to 1945.** [Formerly CMST 221] Critical and historical examination of the methods and effects of public debate and other attempts to influence the attitudes, affective response, and behavior of the American people. Attention to the rhetorical features of selected issues and speakers from 1865 to 1945. [3] (US)

**CMST 3002. Rhetoric of the American Experience, 1945-Present.** [Formerly CMST 225] Critical and historical examination of the methods and effects of public debate and other attempts to influence the attitudes, affective response, and behavior of the American people. Attention to the rhetorical features of selected issues and speakers from 1945 to the present. Serves as repeat credit for students who completed 294 section 3 in fall 2009. [3] (US)

**CMST 3100. Rhetoric of Social Movements.** [Formerly CMST 224] The role of communication in the creation, development, and function of social movements. The analysis of specific rhetorical acts. The study of the arguments, patterns of persuasion, and communication strategies of selected social movements. [3] (US)

**CMST 3110. Women, Rhetoric, and Social Change.** [Formerly CMST 226] Reform rhetoric of American women from 1790 to 1920. Historical influences on women's social activism and emergence on the public platform; rhetorical issues facing women speakers. Rhetorical strategies used by them as advocates for education, labor, abolition, temperance, and the Woman Suffrage Movement. [3] (US)

**CMST 3120. Rhetoric of U.S. Religion.** [Formerly CMST 229] American religious discourse in historical and contemporary contexts. Religious traditions and influential rhetorical texts. Significant religious controversies. No credit for students who earned credit for 294 section 1 in fall 2013. [3] (US)

**CMST 3140. Communication and the First Amendment.** Principles, interpretations, and controversies related to the First Amendment of the United States' Constitution. Emphasis on freedom of religion, freedom of speech, and freedom of the press. No credit for students who earned credit for 294 section 1 in spring 2015. [3] (US)

**CMST 3600. The Rhetorical Tradition.** [Formerly CMST 222] Development of rhetorical concepts from classical Greece to the present. Significant rhetoricians and texts. The impact of context on rhetoric. [3] (HCA)

**CMST 3620. Rhetoric, Culture, and Critique.** [Formerly CMST 254] Rhetorical criticism of cultural texts and artifacts, including oratory, mass media, and other forms of public discourse. Fundamentals of effective rhetorical analysis and writing. Repeat credit for students who have completed 3620W. [3] (HCA)

**CMST 3620W. Rhetoric, Culture, and Critique.** [Formerly CMST 254W] Rhetorical criticism of cultural texts and artifacts, including oratory and mass media. Fundamentals of rhetorical analysis and writing. Repeat credit for students who have completed 3620. [3] (HCA)

**CMST 3700. Politics and Mass Media.** [Formerly CMST 244] Impact of mass-mediated communication on U.S. electoral politics. Pragmatic and ethical influences on the dissemination of information to voters during campaigns. [3] (HCA)

**CMST 3710. Cultural Rhetorics of Film.** [Formerly CMST 243] Film as rhetorical response to historical and cultural change. Filmic treatment of historical trauma; related genres, such as horror and melodrama. [3] (HCA)

**CMST 3720. Communicating Gender.** [Formerly CMST 235] Dominant modes of communicating gender ideology. Effects on policy, politics, and popular culture. Includes theories of rhetoric, gender, sexuality, race, and social class. [3] (P)

**CMST 3740. Rhetoric of Medicine and Health.** Cultural construction of medicine and health through narratives, metaphors, and bodily practices. Case studies in art, ethics, activism, and public controversy. No credit for students who have earned credit for 3890 section 1 offered spring 2016. [3] (P)

**CMST 3840. Directed Readings.** [Formerly CMST 290] Supervised reading and writing in a selected field of the discipline under the guidance of a faculty supervisor. Consent of both the faculty supervisor and the director of undergraduate studies required. Normally open only to majors in communication studies. May be repeated for a total of 6 credits in 3850 and 3840 combined, but students may earn only up to 3 credits per semester of enrollment. [3; maximum of 6 credits total for all semesters of CMST 3850 and 3840] (No AXLE credit)

**CMST 3850. Independent Study.** [Formerly CMST 289] A research project in rhetorical criticism to be arranged with the individual instructor. Designed for students who have taken either 3000 or 3001. May be repeated for a total of 6 credits in 3850 and 3840 combined, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of CMST 3850 and 3840] (No AXLE credit)

**CMST 3890. Selected Topics in Communication Studies.** [Formerly CMST 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**CMST 4940. Seminars in Selected Topics.** [Formerly CMST 295] Topics of special interest. May be repeated for a total of 6 credits in 4940 and 4941 combined if there is no duplication in topic. Students may enroll in more than one section of this course per semester of enrollment. Prerequisite: 15 hours of Communication Studies. [3; maximum of 6 credits total for all semesters of CMST 4940 and 4941] (No AXLE credit)

**CMST 4941. Seminars in Selected Topics.** [Formerly CMST 296] Topics of special interest. May be repeated for a total of 6 credits in 4940 and 4941 combined if there is no duplication in topic. Students may enroll in

more than one section of this course per semester of enrollment. Prerequisite: 15 hours of Communication Studies. [3; maximum of 6 credits total for all semesters of CMST 4940 and 4941] (No AXLE credit)

## Earth and Environmental Sciences

**EES 1001. Commons Seminar.** [Formerly EES 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**EES 1030. Oceanography.** [Formerly EES 103] An introduction to the geology, biology, chemistry, and physics of the marine environment. [3] (MNS)

**EES 1030L. Oceanography Laboratory.** [Formerly EES 113] Laboratory to accompany 1030. Corequisite: 1030. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1030. [1] (No AXLE credit)

**EES 1070. Volcanoes: Impacts on Earth and Society.** [Formerly EES 107] How magmas form and volcanoes erupt; eruption processes and their hazards to society. Volcanic influence on human history and the evolution of the Earth. No credit for students who have earned credit for 1111 section 3. [3] (MNS)

**EES 1080. Earth and Atmosphere.** [Formerly EES 108] The science of the atmosphere: principles of weather and climate; the atmosphere as part of the Earth system; weather forecasting; hurricanes, tornadoes, and severe storms; human impacts, such as air pollution and climate change. [3] (P)

**EES 1111. First-Year Writing Seminar.** [Formerly EES 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**EES 1140. Ecology, Evolution, and Climates through Time.** [Formerly EES 114] Biological responses to global climate and environmental change through geologic time. Causes of climate change and its impact on biodiversity, including extinction implications. Interactions between climate, environments, and the evolution of organisms, emphasizing vertebrates during the past 65 million years. [3] (MNS)

**EES 1400. Iceland's Geology.** [Formerly EES 140] Processes that shape Icelandic landscapes. Volcanoes, glaciers, rivers, ocean, climate. History of interaction between the environment and Icelanders. Introduction at Vanderbilt, two weeks Icelandic field experience; laboratory includes both classroom and field work. Prerequisite: 1510, 1070, or 1111. [4] (MNS)

**EES 1510. The Dynamic Earth: Introduction to Geological Sciences.** [Formerly EES 101] Processes that have changed the earth. Relation between these processes and their products (e.g., earthquakes, minerals and rocks, mountains, oceanic features); interactions between processes affecting the solid, liquid, and gaseous components of earth; impact on humans. [3] (MNS)

**EES 1510L. Dynamic Earth Laboratory.** [Formerly EES 111] Laboratory to accompany 1510. Corequisite: 1510. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1510. [1] (No AXLE credit)

**EES 2110. Global Climate Change.** [Formerly EES 201] Science and policy of global climate change: history and causes of climate change in Earth's past, with emphasis on the last 2 million years; evidence of human impacts on climate since 1850; future climate change and its economic, social, and ecological consequences; economic, technological, and public policy responses. Prerequisite: 1510 or 1080. [3] (MNS)

**EES 2150. Science, Risk, and Policy.** [Formerly EES 205] Assessment and management of deadly risks: comparison of markets, regulatory agencies, and courts for managing risks; cultural and scientific construction of risk; psychology of risk perception; case studies such as Hurricane Katrina, mad cow disease, and air pollution. [3] (P)

**EES 2510. Earth Systems through Time.** [Formerly EES 202] Effects of feedbacks between the geologic cycles on the lithosphere, hydrosphere, biosphere, and atmosphere at diverse intervals in the Earth's history. Present and future implications. Interpretations of evidence recorded in Earth materials. Three hours of lecture and one laboratory per week. Repeat credit for students who have completed 1020. Prerequisite: 1510 and 1510L. [4] (MNS)

**EES 3220. Life Through Time.** [Formerly EES 220] Ecology, classification, and evolution of important groups of fossils, emphasizing invertebrates. Change in marine ecosystems through geologic time. Causes and effects of rapid evolution events and mass extinctions. Three hours of lecture and one laboratory period per week. Prerequisite: 1510, BSCI 1100, or BSCI 1511. [4] (MNS)

**EES 3250. Earth Materials.** [Formerly EES 225] Solid materials that make up the earth; rock, soil, and sediment - with emphasis on the minerals that are their major constituents. Hand specimen, optical, and X-ray methods of description and identification. Physical and chemical processes that form and modify earth materials and the use of these materials in interpreting earth processes of the past and present. Field trips. Three lectures and one laboratory per week. Prerequisite: 1510. [4] (MNS)

**EES 3260. Petrology.** [Formerly EES 226] Nature, distribution, and theories of origin of igneous, metamorphic, and sedimentary rocks. Mineralogy as a function of rock-forming conditions. Laboratory emphasis on description and interpretation of rocks, using hand sample and microscope techniques. Field trips. Three lectures and one laboratory period per week. Prerequisite: 3250. [4] (MNS)

**EES 3330. Sedimentology.** [Formerly EES 230] The origin and composition of sedimentary particles, their transportation to the site of deposition, actual deposition, and the processes involved in lithifying sediments into solid rock. Emphasis on interpretation of ancient source areas and depositional environments. Terrigenous, carbonate, and other rock types will be studied. Field trips. Three lectures and one laboratory period. No credit for graduate students in EES. Prerequisite or corequisite: 2510. [4] (MNS)

**EES 3340. Structural Geology and Rock Mechanics.** [Formerly EES 240] Principles of rock deformation; mechanics, fractures, folds, foliation, primary structures, applications of principles. Interactions and feedbacks between tectonics, climate, and erosion. Field trips. Two lectures and one laboratory period per week. Prerequisite: 2510. [4] (MNS)

**EES 3841. Directed Study.** [Formerly EES 289A] Readings in related fields and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students or by consent of the department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 2 credits per semester of enrollment. [1-2] (No AXLE credit)

**EES 3842. Directed Study.** [Formerly EES 289B] Readings in related fields and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students or by consent of the department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 2 credits per semester of enrollment. [1-2] (No AXLE credit)

**EES 3851. Independent Study.** [Formerly EES 291A] Readings with related field and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students. Other students must have consent of department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**EES 3852. Independent Study.** [Formerly EES 291B] Readings with related field and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students. Other students must have consent

of department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**EES 3865. Field Investigations.** [Formerly EES 210] Content varies according to location and disciplinary focus. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (MNS)

**EES 3891. Special Topics.** [Formerly EES 290] Topics vary. May be repeated for credit more than once by permission of the director of undergraduate studies. Students may enroll in more than one section of this course each semester. Prerequisite: 1510. [3] (No AXLE credit)

**EES 4420. Geomorphology.** [Formerly EES 261] Analysis of the Earth's landforms, their morphology, history, and the processes that form them. The building of relief and its subsequent transformation by geologic processes on hillslopes, rivers, coasts, wetlands, and glaciers. The natural history and human impacts on land forms. Field trips. Familiarity with basic physics (mechanics) is expected. Prerequisite: 1510. [3] (MNS)

**EES 4550. Transport Processes in Earth and Environmental Systems.** [Formerly EES 255] Principles of conservation and constitutive transport laws; classic and emerging styles of modeling natural systems. Prior study of basic calculus (functions, derivatives, integrals) and physics (mechanics) is expected. Prerequisite: senior or graduate standing with a major in Earth and Environmental Sciences, Biological Sciences, Chemistry, Mathematics, Physics, or the School of Engineering. [3] (MNS)

**EES 4600. Geochemistry.** [Formerly EES 260] Application of chemistry to study the distribution and cycling of elements in the crust of the earth. Includes chemical bonding and crystallization, phase rules and phase diagrams, chemical equilibria, theories on the origin of elements, earth, ocean, atmosphere, and crust. Prerequisite: 3250 and CHEM 1602. [3] (MNS)

**EES 4650. Physics of the Climate System.** Physical processes affecting the climate system. Global energy balance of Earth and planets. Surface temperature and how it is regulated. Electromagnetic radiation and its interaction with atmospheric gases, clouds, and aerosols. Ocean heat storage, cloud and precipitation processes, and the impact of sea and inland ice on temperature. Processes that govern the water and carbon cycle. No credit for students who have earned credit for 290-01 offered spring 2014 or spring 2015. [3] (MNS)

**EES 4680. Paleoclimates.** [Formerly EES 268] Fluctuations in Earth's climate with an emphasis on the past 700 million years. Forcings and feedback that influence climate and drive change. Techniques used to reconstruct past climate change using marine and terrestrial geologic deposits and geochronologic methods. Prerequisite: 1510 and 2510. [3] (MNS)

**EES 4750. Sustainable Systems Science.** [Formerly EES 275] A system dynamics approach to examining principles, problems, and solutions pertaining to the links among the environment, society, and economy. Components of sustainable systems. No credit for students who earned credit for 390 section 3 in spring 2010. Prerequisite: at least junior standing with a major in Earth and Environmental Sciences, Biological Sciences, Chemistry, Physics, or the School of Engineering. [3] (MNS)

**EES 4760. Agent- and Individual-Based Computational Modeling.** Applications in natural, social, and behavioral sciences and engineering. Designing, programming, and documenting models. Using models for experiments. Examples from environmental science, ecology, economics, urban planning, and medicine. Familiarity with basic statistics and proficiency in algebra are expected. [3] (MNS)

**EES 4820. Paleoecological Methods.** [Formerly EES 282] Tools used to interpret past environments and climates, including plant microfossils, pollen and phytoliths, vertebrate morphology, and dental microwear and mesowear. Geochemical tools such as stable isotopes and rare earth elements. Integrating methods for paleontological and anthropological studies, including the use of databases and meta-analyses. Readings from primary sources. Serves as repeat credit for students who completed 390 section 4 in spring 2010. Prerequisite: 1510. [3] (MNS)

**EES 4830. Volcanic Processes.** [Formerly EES 285] Nature, behavior, and origin of volcanoes. Magmatic processes that lead to eruptions. Eruptive processes and volcano construction. Impacts of volcanism on Earth's surface environment. Prerequisite: 3260. [3] (MNS)

**EES 4961. Senior Seminar.** [Formerly EES 299] Integrating concepts and information from diverse fields. Offered on a graded basis only. Limited to seniors in the final semester of the major. [1] (No AXLE credit)

**EES 4998. Senior Honors Research.** [Formerly EES 292A] Independent research under faculty supervision that culminates in an oral presentation and written thesis submitted to the faculty. Open only to departmental honors candidates. Does not count toward minimum requirements for the major. [2] (No AXLE credit)

**EES 4999. Senior Honors Research.** [Formerly EES 292B] Independent research under faculty supervision that culminates in an oral presentation and written thesis submitted to the faculty. Open only to departmental honors candidates. Does not count toward minimum requirements for the major. [2] (No AXLE credit)

## Economics

**ECON 1001. Commons Seminar.** [Formerly ECON 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ECON 1010. Principles of Macroeconomics.** [Formerly ECON 100] The role of scarcity and prices in allocating resources. National income, fluctuations in unemployment and price level, monetary and fiscal policy. [3] (SBS)

**ECON 1020. Principles of Microeconomics.** [Formerly ECON 101] The behavior of households and business in markets. Competition, monopoly, and rivalry in product and factor markets. Equilibrium. Income distribution. International trade. Prerequisite: 1010. [3] (SBS)

**ECON 1111. First-Year Writing Seminar.** [Formerly ECON 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**ECON 1500. Economic Statistics.** [Formerly ECON 150] The use of quantitative data in understanding economic phenomena. Probability, sampling, inference, and regression analysis. No credit for students who have earned credit for 1510. Prerequisite: Math 1100, 1200, or 1300. [3] (SBS)

**ECON 1510. Intensive Economic Statistics.** [Formerly ECON 155] Quantitative techniques in economic analysis. Probability sampling, inference, and multiple regression. No credit for students who have earned credit for 1500. Prerequisite: MATH 1100, 1200 or 1300. [3] (SBS)

**ECON 2100. Labor Economics.** [Formerly ECON 212] Introduction to labor markets in the United States. Foundations and applications of labor supply and demand, immigration and immigration policies, investment in human capital, wage policies of employers, minimum wage legislation, labor market discrimination and remedial programs, effects of labor unions, and unemployment. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2150. Economic History of the United States.** [Formerly ECON 226] Economic development of the United States from the Colonial period to the present. Interrelated changes in economic performance, technology, institutions, and governmental policy. Prerequisite: 1010 and 1020. [3] (US)

**ECON 2160. Strategic Analysis.** [Formerly ECON 235] Introduction to sequential and simultaneous games. Backward induction, equilibrium, pure and mixed strategies. Cooperation and conflict, the prisoner's dilemma, threats, promises, and credibility. Brinkmanship, uncertainty, the role of information, auction design, bidding strategies, and bargaining. Voting and agenda control. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2170. Environmental Economics.** [Formerly ECON 228] Public policies to address market failures. Energy policy, climate change, biodiversity, globalization, and population growth. Sustainable economic activity, recycling, valuing environmental amenities, addressing ethical dilemmas, and resolving disputes. Offered on a graded basis only. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2180. Sports Economics.** [Formerly ECON 242] Intercollegiate and professional sports leagues. Competitive balance, player labor markets, and owner capital markets. Theories of league expansion, rival leagues, franchise relocation, and sports venue finance. Comparisons of international sports leagues. Offered on a graded basis only. No credit for students who have earned credit for 270. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2220. Latin American Development.** [Formerly ECON 222] Economic growth and structural change. Historical legacies, import-substitution, debt crisis, inflation, and macroeconomic stabilization. Regional and national economic integration, migration, and conflict. Poverty, inequality, and policies. No credit for graduate students in economics. Prerequisite: 1010. [3] (SBS)

**ECON 2240. Russia in the World Economy.** [Formerly ECON 224] Trade, finance, labor markets, income, and economic growth following the introduction of a market economy. Energy, manufacturing, and education sectors. Politics, government, and social change. Fiscal, monetary, and exchange rate policies. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2260. International Economics.** Causes, consequences, and conduct of economic interactions among sovereign nations. Trade in goods and services; international monetary and financial interactions; winners and losers; exchange rates and the balance of payments; economic organizations. Offered on a graded basis only. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2300. Money and Banking.** [Formerly ECON 209] A study of commercial banks and other intermediaries between savers and investors in the United States, including the government's role as money creator, lender, and regulator of private credit, and the effects of financial institutions on aggregate economic activity. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2340. Plunder and Pillage: The Economics of Warfare and Conflict.** [Formerly ECON 230] International and domestic economic conflict. Offensive and defensive strategies. Fortifications, strategic bombing, and conscription. Corporate takeovers, bargaining failures, and labor strikes. Prerequisites: 1010 and 1020. [3] (SBS)

**ECON 2350. Health Care Policy.** [Formerly ECON 221] Health care markets in the United States. Supply and demand, social insurance policies, pharmaceuticals, malpractice, and health care reform. Prerequisite: 1010 and 1020. [3] (SBS)

**ECON 2890. Special Topics.** [Formerly ECON 249] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 1010 and 1020. [3] (No AXLE credit)

**ECON 3010. Intermediate Microeconomic Theory.** [Formerly ECON 231] Development of the techniques of analysis for problems of resource allocation. Theories of choice and production for individual economic agents in competitive and monopolistic environments. Behavior of markets. Determination of prices, wages, interest, rent, and profit. Income distribution. No credit for graduate students in economics. Prerequisite: 1010, 1020, and either MATH 1100, 1200, or 1300. [3] (SBS)

**ECON 3020. Intermediate Macroeconomic Theory.** [Formerly ECON 232] National income accounting and analysis. Classical, Keynesian, and contemporary models determining national income, employment, liquidity, price level, and economic growth. No credit for graduate students in economics. Prerequisite: 1010, 1020, and either MATH 1100, 1200, or 1300. [3] (SBS)

**ECON 3050. Introduction to Econometrics.** [Formerly ECON 253] Quantitative methods of economic analysis. Measurement, specification, estimation, and interpretation of economic models. Econometric computation using microcomputers. No credit for graduate students in econom-

ics. Prerequisite: 3010 and either 1500, 1510, or both MATH 2820L and either MATH 2810 or 2820. [3] (SBS)

**ECON 3100. Wages, Employment, and Labor Markets.** [Formerly ECON 251] Theories of wages and employment, dual labor markets, internal labor markets, and labor's share of national income. Empirical studies of labor mobility, the effects of unions on relative wages and resource allocation, occupational and industrial wage differentials, and selected labor markets. Prerequisite: 3010. [3] (SBS)

**ECON 3110. Poverty and Discrimination.** [Formerly ECON 267] Theories and empirical evidence concerning inequality, poverty, and discrimination, and their relationship to economic growth. Evaluation of anti-poverty and anti-discrimination policies. Prerequisite: 3010 and either 1500, 1510, 3050, or MATH 2821. [3] (SBS)

**ECON 3150. Topics in the Economic History of the U.S.** [Formerly ECON 266] Analysis of major issues and debates in American economic history. Prerequisite: 3010. [3] (US)

**ECON 3160. Economic History of Europe.** [Formerly ECON 271] Sources of Western European economic progress. Organization of overseas merchant empires, origins of the Industrial Revolution, the role of property rights, demographic patterns, and changing living standards. Prerequisite: 3010. [3] (SBS)

**ECON 3180. History of Economic Thought.** [Formerly ECON 262] Evolution of economic ideas from the ancient Greeks to the contemporary world with attention to the seminal thoughts of Adam Smith, David Ricardo, J. S. Mill, Alfred Marshall, and J. M. Keynes. Prerequisite: 3010 and 3020. [3] (SBS)

**ECON 3200. Public Finance.** [Formerly ECON 254] Theories of the state and collective decisions, fiscal federalism, public goods and externalities. Tax theory: equity, efficiency, and growth. Taxation of goods, factors, and corporations. Cost-benefit analysis. Prerequisite: 3010. [3] (SBS)

**ECON 3230. Urban Economics.** [Formerly ECON 279] Urban growth, development of suburbs, location of firms, housing markets, transportation, property taxes, and local government services. Offered on a graded basis only. Prerequisite: 3010. [3] (SBS)

**ECON 3250. Industrial Organization.** [Formerly ECON 274] Models of market structure and behavior from monopoly and oligopoly to perfect competition. Strategic interaction between a firm and its customers and between a firm and its competitors. Firm practices and government policies that promote or hinder the efficient operation of markets. Offered on a graded basis only. Prerequisite: 3010. [3] (SBS)

**ECON 3300. Financial Instruments and Markets.** [Formerly ECON 259] Theoretical and empirical approaches to the analysis of monetary and other financial instruments. Portfolio analysis, interest rate risk, and financial futures and options markets. Prerequisite: 3010 and 3020. [3] (SBS)

**ECON 3350. Economics of Health.** [Formerly ECON 268] Demand for health and health care. Value of health, life, and medical innovation. Health insurance. Supply and organization of health care services. U.S. health care reforms. Prerequisite: 3010. [3] (SBS)

**ECON 3600. International Trade.** [Formerly ECON 263] International trade in goods and services. Patterns of trade; gains and losses from trade, tariffs, and other commercial policies; economic integration; and international factor movements. Offered on a graded basis only. No credit for students who have earned credit for 7600. Prerequisite: 3010. [3] (SBS)

**ECON 3610. International Finance.** [Formerly ECON 264] Economics of international monetary, financial, and macroeconomic relationships. Effects of monetary and fiscal politics in open economies, balance of payments, exchange rate determination, and international monetary institutions. Prerequisite: 3020. [3] (SBS)

**ECON 3650. Development Economics.** [Formerly ECON 288] Determinants of national economic growth for pre-industrial and newly industrial countries. Inequality and poverty. Imperfect credit markets and microfinance. Political constraints and corruption. Policy issues relevant to developing economics. Prerequisite: 3010 and either 1500, 1510, 3050, or MATH 2821. [3] (INT)

**ECON 3698. Junior Honors Research.** Honors thesis proposal under the supervision of a thesis adviser and the Director of Honors. Open only to junior majors with the approval of the Director of Honors. Prerequisite: 3010. [1] (No AXLE credit)

**ECON 3700. Economic Growth.** [Formerly ECON 281] Determinants of macroeconomic growth. Mathematical theories of exogenous and endogenous growth. Comparison of growth rates across countries and time. The effect of growth rates on economic well-being. The effect of tax rates. No credit for students who earned credit for 294 section 1 in spring 2013. Prerequisite: 3010 and 3020. [3] (SBS)

**ECON 3851. Independent Study in Economics.** [Formerly ECON 291A] A program of independent reading in economics, arranged in consultation with an adviser. Limited to students having written permission from an instructor and the director of undergraduate studies. Prerequisite: 3010. [Variable credit: 1-3 each semester, or 1-6 for departmental honors candidates; maximum of 12 hours in 3851 and 3852 combined for departmental honors students; maximum of 6 hours in 3851 and 3852 combined for other students] (No AXLE credit)

**ECON 3852. Independent Study in Economics.** [Formerly ECON 291B] A program of independent reading in economics, arranged in consultation with an adviser. Limited to students having written permission from an instructor and the director of undergraduate studies. Prerequisite: 3010. [Variable credit: 1-3 each semester, or 1-6 for departmental honors candidates; maximum of 12 hours in 3851 and 3852 combined for departmental honors students; maximum of 6 hours in 3851 and 3852 combined for other students] (No AXLE credit)

**ECON 3893. Selected Microeconomic Topics.** [Formerly ECON 293] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3010. [3] (No AXLE credit)

**ECON 3894. Selected Macroeconomic Topics.** [Formerly ECON 294] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3020. [3] (No AXLE credit)

**ECON 4050. Topics in Econometrics.** [Formerly ECON 284] Emphasis on applications. May include generalized method of moments, empirical likelihood, resampling methods, and nonparametric techniques. Prerequisite: 3050. [3] (SBS)

**ECON 4110. Macroeconomic Models for Policy Analysis.** [Formerly ECON 265] Mathematical models of overlapping generations, rational expectations, and open economies with price rigidities applied to social security, government debt, exchange rates, monetary policy, and time inconsistent optimal policy. Prerequisite: 3020. [3] (SBS)

**ECON 4210. Law and Economics.** [Formerly ECON 285] The influence of legal rules and institutions on the behavior of individuals and on economic efficiency and equity. Applications from civil procedure as well as property, contract, tort, and criminal law. Offered on a graded basis only. Prerequisite: 3010 and either 1500, 1510, 3050, or MATH 2821. [3] (SBS)

**ECON 4220. Social Choice Theory.** [Formerly ECON 255] Strategic and non-strategic social choice theory. Preference aggregation, formal models of voting, and matching. Prerequisite: 3010 or PHIL 3003 or any Mathematics course numbered 2500 or above. [3] (SBS)

**ECON 4260. Game Theory with Economic Applications.** [Formerly ECON 273] Rational decision-making in non-cooperative, multi-person games. Single play and repeated games with complete and incomplete information. Economic applications of games, such as auctions, labor-management bargaining, pricing and output decisions in oligopoly, and common property resources. Prerequisite: 3010. [3] (SBS)

**ECON 4510. Seminar in Macroeconomic Policy.** [Formerly ECON 256] Intensive study of three or four current problems in economic policy. Studies in topics such as macroeconomic policy for the year ahead, financial market issues, international economic policy issues. Repeat credit for students who have completed 4510W. Limited to majors in economics and public policy. Prerequisite: 3010 and 3020. [3] (SBS)

**ECON 4510W. Seminar in Macroeconomic Policy.** [Formerly ECON 256W] Intensive study of three or four current problems in economic policy. Studies in topics such as macroeconomic policy for the year ahead, financial market issues, international economic policy issues. Repeat credit for students who have completed 4510. Limited to majors in economics and public policy. Prerequisite: 3010 and 3020. [3] (SBS)

**ECON 4520W. Seminar on Globalization.** [Formerly ECON 260W] Causes of global economic integration. Winners and losers. World Trade Organization, international environmental treaties, labor and capital markets. U.S. leadership. Offered on a graded basis only. No credit for students who earned credit for 257W in spring 2009. Prerequisite: 3010 and either 1500, 1510, 3050, or MATH 2821. [3] (SBS)

**ECON 4530. Seminar in Microeconomic Policy.** [Formerly ECON 257] Intensive study of three or four current problems in microeconomic policy. Repeat credit for students who have completed 4530W. Limited to majors in economics and public policy. Prerequisite: 3010. [3] (SBS)

**ECON 4530W. Seminar in Microeconomic Policy.** [Formerly ECON 257W] Intensive study of three or four current problems in microeconomic policy. Repeat credit for students who have completed 4530. Limited to majors in economics and public policy. Prerequisite: 3010. [3] (SBS)

**ECON 4540W. Economics of Conflict.** [Formerly ECON 277W] Economic relationships that appropriate value from other parties. War, crime, litigation, family quarrels, and rent-seeking. The visible hand, principal-agent problems, and negative sum games. Serves as repeat credit for students who completed 257W section 3 in spring 2010 and section 1 in fall 2010. Prerequisite: 3010. [3] (SBS)

**ECON 4550. Seminar in Sports Economics.** [Formerly ECON 280] Issues and debates. Offered on a graded basis only. Prerequisite: 2180, 3010. [3] (SBS)

**ECON 4981. Honors Seminar.** [Formerly ECON 295A] Discussion of selected topics and senior thesis research. Open only to seniors in the departmental honors program. Prerequisite: 3010. [1] (No AXLE credit)

**ECON 4982. Honors Seminar.** [Formerly ECON 295B] Discussion of selected topics and senior thesis research. Open only to seniors in the departmental honors program. Prerequisite: 3010. [1] (No AXLE credit)

**ECON 4998. Senior Thesis.** [Formerly ECON 292A] Limited to and required of all candidates for departmental honors. Prerequisite: 3010. [1-3] (No AXLE credit)

**ECON 4999. Senior Thesis.** [Formerly ECON 292B] Limited to and required of all candidates for departmental honors. Prerequisite: 3010. [1-3] (No AXLE credit)

## English

**ENGL 1001. Commons Seminar.** [Formerly ENGL 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ENGL 1100. Composition.** [Formerly ENGL 100] For students who need to improve their writing. Emphasis on writing skills, with some analysis of modern nonfiction writing. [3] (No AXLE credit)

**ENGL 1111. First-Year Writing Seminar.** [Formerly ENGL 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**ENGL 1210W. Prose Fiction: Forms and Techniques.** [Formerly ENGL 104W] Close study of short stories and novels and written explication of these forms. [3] (HCA)

**ENGL 1220W. Drama: Forms and Techniques.** [Formerly ENGL 105W] Close study of representative plays of the major periods and of the main formal categories (tragedy, comedy) and written explication of these forms. [3] (HCA)

**ENGL 1230W. Literature and Analytical Thinking.** [Formerly ENGL 102W] Close reading and writing in a variety of genres drawn from several periods. Productive dialogue, persuasive argument, and effective prose style. Offered on a graded basis only. [3] (HCA)

**ENGL 1250W. Introduction to Poetry.** [Formerly ENGL 116W] Close study and criticism of poems. The nature of poetry, and the process of literary explication. [3] (HCA)

**ENGL 1260W. Introduction to Literary and Cultural Analysis.** [Formerly ENGL 118W] Analysis of a range of texts in social, political, and aesthetic contexts. Interdisciplinary study of cultural forms as diverse as poetry, advertisement, and film. [3] (HCA)

**ENGL 1270W. Introduction to Literary Criticism.** [Formerly ENGL 117W] Selected critical approaches to literature. [3] (HCA)

**ENGL 1280. Beginning Fiction Workshop.** [Formerly ENGL 122] Introduction to the art of writing prose fiction. [3] (HCA)

**ENGL 1290. Beginning Poetry Workshop.** [Formerly ENGL 123] Introduction to the art of writing poetry. [3] (HCA)

**ENGL 1300W. Intermediate Composition.** [Formerly ENGL 120W] A writing course including the analysis of essays from a variety of disciplines. [3] (HCA)

**ENGL 2200. Foundations of Literary Study.** [Formerly ENGL 199] Fundamentals of literary study: close reading; analytic writing; historical context; abstract reasoning in theory; creative expression. [3] (HCA)

**ENGL 2310. Representative British Writers.** [Formerly ENGL 208A] Selections from British literature with attention to contexts and literary periods. From the beginnings to 1660. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. [3] (HCA)

**ENGL 2311. Representative British Writers.** [Formerly ENGL 208B] Selections from British literature with attention to contexts and literary periods. From 1660 to the present. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. [3] (HCA)

**ENGL 2316. Representative American Writers.** [Formerly ENGL 211] Selections from the entire body of American literature with attention to contexts and literary periods. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. Repeat credit for students who have completed 2316W. [3] (US)

**ENGL 2316W. Representative American Writers.** [Formerly ENGL 211W] Selections from the entire body of American literature with attention to contexts and literary periods. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. Repeat credit for students who have completed 2316. [3] (US)

**ENGL 2318. World Literature, Classical.** [Formerly ENGL 236] Great Books from the points of view of literary expression and changing ideologies: Classical Greece through the Renaissance. Repeat credit for students who have completed 2318W. [3] (HCA)

**ENGL 2318W. World Literature, Classical.** [Formerly ENGL 236W] Great Books from the points of view of literary expression and changing ideologies: Classical Greece through the Renaissance. Repeat credit for students who have completed 2318. [3] (HCA)

**ENGL 2319. World Literature, Modern.** [Formerly ENGL 237] Great Books from the points of view of literary expression and changing ideologies: The 17th century to the contemporary period. Repeat credit for students who have completed 2319W. [3] (HCA)

**ENGL 2319W. World Literature, Modern.** [Formerly ENGL 237W] Great Books from the points of view of literary expression and changing ideologies: The 17th century to the contemporary period. Repeat credit for students who have completed 2319. [3] (HCA)

**ENGL 2320. Southern Literature.** [Formerly ENGL 212] The works of Southern writers from Captain Smith to the present. Topics such as the

Plantation Myth, slavery and civil war, Agrarianism, and "post-southernism." Authors may include Poe, Twain, Cable, Faulkner, Welty, Percy, Wright. [3] (HCA)

**ENGL 3210. Intermediate Nonfiction Writing.** [Formerly ENGL 200] Instruction in the forms and techniques of nonfiction writing. Admission by consent of instructor. May be repeated once for credit. [3] (HCA)

**ENGL 3215. The Art of Blogging.** Conventions of the rapidly evolving literary form of blogging. Creation and maintenance of a personal blog. Critique of online journalism across many genres, including activism, politics, science, and arts and culture. Interaction with professional bloggers. No credit for students who have earned credit for 200-03 offered fall 2014 or for 200-02 offered fall 2013. [3] (HCA)

**ENGL 3220. Advanced Nonfiction Writing.** [Formerly ENGL 201] Further instruction in the form and techniques of nonfiction writing. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3220] (HCA)

**ENGL 3230. Intermediate Fiction Workshop.** [Formerly ENGL 204] Instruction in fiction writing. Supplementary readings that illustrate traditional aspects of prose fiction. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3230] (HCA)

**ENGL 3240. Advanced Fiction Workshop.** [Formerly ENGL 205] Continuing instruction in fiction writing. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3240] (HCA)

**ENGL 3250. Intermediate Poetry Workshop.** [Formerly ENGL 206] Instruction in poetry writing. Supplementary readings illustrating traditional aspects of poetry. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3250] (HCA)

**ENGL 3260. Advanced Poetry Workshop.** [Formerly ENGL 207] Continuing instruction in poetry writing. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3260] (HCA)

**ENGL 3280. Literature and the Craft of Writing.** [Formerly ENGL 202] The forms and techniques of creative writing. Contemporary practices in fiction and poetry in historical context. [3] (HCA)

**ENGL 3310. Anglo-Saxon Language and Literature.** [Formerly ENGL 219] The study of the Old English language. Selected historical and literary prose. Short heroic poems. Serves as repeat credit for students who completed 296a before fall 2012. [3] (HCA)

**ENGL 3314. Chaucer.** [Formerly ENGL 220] Study of *The Canterbury Tales* and Chaucer's world. [3] (HCA)

**ENGL 3316. Medieval Literature.** [Formerly ENGL 221] The drama, lyrics, romance, allegory, and satire of the fourteenth and fifteenth centuries, studied in the context of the period's intellectual climate and social change. [3] (HCA)

**ENGL 3318. The History of the English Language.** [Formerly ENGL 240] The development of English syntax. History of the English vocabulary: word formation, borrowing, semantic change, and meter. [3] (HCA)

**ENGL 3330. Sixteenth Century.** [Formerly ENGL 248] Prose and poetry of the sixteenth century. Emphasis on Spenser and his contemporaries. [3] (HCA)

**ENGL 3332. English Renaissance: The Drama.** [Formerly ENGL 250] English drama, exclusive of Shakespeare, from 1550-1642: Marlowe, Jonson, Webster, and others. [3] (HCA)

**ENGL 3335. English Renaissance Poetry.** Development of the English poetic tradition from 1500-1700. Repeat credit for students who have earned credit for 3335W. [3] (HCA)

**ENGL 3335W. English Renaissance Poetry.** Development of the English poetic tradition from 1500-1700. Repeat credit for students who have earned credit for 3335. [3] (HCA)

**ENGL 3336. Shakespeare.** [Formerly ENGL 209A] About twenty of the major plays considered in chronological order over two terms, with emphasis on Shakespeare's development as a dramatic artist. Primarily comedies and histories. [3] (HCA)

**ENGL 3337. Shakespeare.** [Formerly ENGL 209B] About twenty of the major plays considered in chronological order over two terms, with emphasis on Shakespeare's development as a dramatic artist. Primarily tragedies and romances. [3] (HCA)

**ENGL 3340. Shakespeare: Representative Selections.** [Formerly ENGL 210] A representative selection of plays, including histories, tragedies, comedies, and romances, designed to give the student a sense of the full range of Shakespeare's work in one semester. Repeat credit for students who have completed 3340W. [3] (HCA)

**ENGL 3340W. Shakespeare: Representative Selections.** [Formerly ENGL 210W] A representative selection of plays, including histories, tragedies, comedies, and romances, designed to give the student a sense of the full range of Shakespeare's work in one semester. Repeat credit for students who have completed 3340. [3] (HCA)

**ENGL 3346. Seventeenth-Century Literature.** [Formerly ENGL 249] Poetry and prose from 1600 to the English Civil War, such as Metaphysical and Cavalier poetry, essays, romances, and satires. Authors may include Bacon, Cavendish, Donne, Herbert, Jonson, Lanier, Marvell, and Wroth. [3] (HCA)

**ENGL 3348. Milton.** [Formerly ENGL 251] The early English poems; *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*; the major prose. [3] (HCA)

**ENGL 3360. Restoration and the Eighteenth Century.** [Formerly ENGL 252A] Explorations of the aesthetic and social world of letters from the English Civil War to the French Revolution. Drama, poetry, and prose, including Restoration plays, political poetry, satire, travel narratives, and tales. Authors may include Behn, Dryden, Congreve, Addison, Swift, Finch, Pope, Fielding, Burney, Johnson, and Inchbald. Earlier writers. [3] (HCA)

**ENGL 3361. Restoration and the Eighteenth Century.** [Formerly ENGL 252B] Explorations of the aesthetic and social world of letters from the English Civil War to the French Revolution. Drama, poetry, and prose, including Restoration plays, political poetry, satire, travel narratives, and tales. Authors may include Behn, Dryden, Congreve, Addison, Swift, Finch, Pope, Fielding, Burney, Johnson, and Inchbald. Later writers. [3] (HCA)

**ENGL 3364. The Eighteenth-Century English Novel.** [Formerly ENGL 230] The English novel from its beginning through Jane Austen. Development of the novel as a literary form, and study of selected works of Defoe, Richardson, Fielding, Sterne, and other novelists of the period. [3] (HCA)

**ENGL 3370. The Bible in Literature.** [Formerly ENGL 282] An examination of ways in which the Bible and biblical imagery have functioned in literature and fine arts, in both "high culture" and popular culture, from Old English poems to modern poetry, drama, fiction, cartoons, and political rhetoric. Readings include influential biblical texts and a broad selection of literary texts drawn from all genres and periods of English literature. [3] (HCA)

**ENGL 3610. The Romantic Period.** [Formerly ENGL 254A] Prose and poetry of the Wordsworths, the Shelleys, Byron, Keats, and others. [3] (HCA)

**ENGL 3611. The Romantic Period.** [Formerly ENGL 254B] Continuation of 3610. Prose and poetry of the Wordsworths, the Shelleys, Byron, Keats, and others. [3] (HCA)

**ENGL 3614. The Victorian Period.** [Formerly ENGL 255] Works of Tennyson, Browning, Arnold, Hardy, and others. [3] (HCA)

**ENGL 3618. The Nineteenth-Century English Novel.** [Formerly ENGL 231] The study of selected novels of Dickens, Thackeray, Emily Brontë, George Eliot, George Meredith, Thomas Hardy, and other major novelists of the period. [3] (HCA)

**ENGL 3620. Nineteenth-Century American Literature.** [Formerly ENGL 266] Explorations of themes, forms, and social and cultural issues shaping the works of American writers. Authors may include Cooper, Poe, Hawthorne, Douglass, Jacobs, Stowe, Melville, Dickinson, Alcott, Whitman, and Twain. [3] (HCA)

**ENGL 3622. Nineteenth-Century American Women Writers.** [Formerly ENGL 260] Themes and forms of American women's prose and poetry, with the emphasis on alternative visions of the frontier, progress, class, race, and self-definition. Authors include Child, Kirkland, Fern, Jacobs, Harper, Dickinson, and Chopin. [3] (HCA)

**ENGL 3624W. Literature of the American Civil War.** [Formerly ENGL 213W] Origins and impact of the war as depicted in short stories, novels, poems, and films. Harriet Beecher Stowe, Stephen Crane, Margaret Mitchell, William Faulkner, and Margaret Walker. [3] (US)

**ENGL 3630. The Modern British Novel.** [Formerly ENGL 233] The British novel from the beginning of the twentieth century to the present. Conrad, Joyce, Lawrence, Virginia Woolf, Forster, and other novelists varying at the discretion of instructor. [3] (HCA)

**ENGL 3634. Modern Irish Literature.** [Formerly ENGL 264] Major works from the Irish literary revival to the present, with special attention to the works of Yeats, Synge, Joyce, O'Casey, and Beckett. [3] (HCA)

**ENGL 3640. Modern British and American Poetry: Yeats to Auden.** [Formerly ENGL 256] A course in the interpretation and criticism of selected modern masters of poetry, British and American, with the emphasis on poetry as an art. Poets selected may vary at discretion of instructor. [3] (HCA)

**ENGL 3642. Film and Modernism.** [Formerly ENGL 265] Film in the context of the major themes of literary modernism: the divided self, language and realism, nihilism and belief, and spatialization of time. [3] (HCA)

**ENGL 3644. Twentieth-Century American Novel.** [Formerly ENGL 232A] Explorations of themes, forms, and social cultural issues shaping the works of American novelists. Authors may include Fitzgerald, Faulkner, Hemingway, Hurston, Ellison, McCarthy, Bellow, Kingston, Morrison, Pynchon. Emphasizes writers before 1945. [3] (HCA)

**ENGL 3645. Twentieth-Century American Novel.** [Formerly ENGL 232B] Explorations of themes, forms, and social cultural issues shaping the works of American novelists. Authors may include Fitzgerald, Faulkner, Hemingway, Hurston, Ellison, McCarthy, Bellow, Kingston, Morrison, Pynchon. Emphasizes writers after 1945. [3] (HCA)

**ENGL 3646. Poetry Since World War II.** [Formerly ENGL 258] Poets studied vary at discretion of instructor. Offered on a graded basis only. [3] (HCA)

**ENGL 3650. Ethnic American Literature.** [Formerly ENGL 279] Texts and theory relevant to understanding race, culture, and ethnicity in the formation of American culture. Literature from at least three of the following groups: African Americans, Native Americans, Asian Americans, Chicano/Latino Americans, Caribbean Americans, and European Americans. [3] (P)

**ENGL 3650W. Ethnic American Literature.** [Formerly ENGL 279W] Texts and theory relevant to understanding race, culture, and ethnicity in the formation of American culture. Literature from at least three of the following groups: African Americans, Native Americans, Asian Americans, Chicano/Latino Americans, Caribbean Americans, and European Americans. [3] (P)

**ENGL 3654. African American Literature.** [Formerly ENGL 263] Examination of the literature produced by African Americans. May include literary movements, vernacular traditions, social discourses, material culture, and critical theories. Repeat credit for students who have completed 3654W. [3] (US)

**ENGL 3654W. African American Literature.** [Formerly ENGL 263W] Examination of the literature produced by African Americans. May include literary movements, vernacular traditions, social discourses, material culture,

and critical theories. Repeat credit for students who have completed 3654. [3] (US)

**ENGL 3658. Latino-American Literature.** [Formerly ENGL 275] Texts and theory relevant to understanding constructs of Latino identity, including race, class, gender, and basis for immigration, in the context of American culture. The course focuses on the examination of literature by Chicano, Puerto Rican, Cuban, Dominican, and Latin American writers in the United States. [3] (P)

**ENGL 3662. Asian American Literature.** [Formerly ENGL 277] Diversity of Asian American literary production with specific attention to works after 1965. Topics such as gender and sexuality, memory and desire, and diaspora and panethnicity in the context of aesthetics and politics of Asian American experience. [3] (P)

**ENGL 3662W. Asian American Literature.** [Formerly ENGL 277W] Diversity of Asian American literary production with specific attention to works after 1965. Topics such as gender and sexuality, memory and desire, and diaspora and panethnicity in the context of aesthetics and politics of Asian American experience. [3] (P)

**ENGL 3664. Jewish American Literature.** [Formerly ENGL 283] Nineteenth century to the present. Issues of race, gender, ethnicity, immigration, and diaspora. Offered on a graded basis only. [3] (HCA)

**ENGL 3670. Colonial and Post-Colonial Literature.** [Formerly ENGL 278] Literature exploring European colonialism and its aftermath from the eighteenth century to the present: language, gender, and agency in the colonial encounter; anti-colonial resistance movements; and postcolonial cultures. Topics may vary; course may be taken more than once with permission of the Director of Undergraduate Studies. [3] (HCA)

**ENGL 3670W. Colonial and Post-Colonial Literature.** [Formerly ENGL 278W] Literature exploring European colonialism and its aftermath from the eighteenth century to the present: language, gender, and agency in the colonial encounter; anti-colonial resistance movements; and postcolonial cultures. Topics may vary; course may be taken more than once with permission of the Director of Undergraduate Studies. [3] (HCA)

**ENGL 3674. Caribbean Literature.** [Formerly ENGL 271] Caribbean literature from 1902 to the present. Emphasis on writing since 1952, which marks the beginning of West Indian nationalism and the rise of the West Indian novel. [3] (INT)

**ENGL 3678. Anglophone African Literature.** [Formerly ENGL 276] From the Sundiata Epic to the present with emphasis on the novel. Attention to issues of identity, post coloniality, nationalism, race, and ethnicity in both SubSaharan and Mahgrib literatures. Such authors as Achebe, Ngugi, Gordimer, Awoonor, and El Saadaw. [3] (INT)

**ENGL 3680. Twentieth-Century Drama.** [Formerly ENGL 286A] Topics in twentieth century drama drawn from the American, British, and/or world traditions. Formal structures of dramatic literature studied within contexts of performance, theatrical production, and specific dramatic careers. Authors may include O'Neill, Albee, Hansberry, Hellman, Stoppard, Wilson, and Churchill. Emphasizes American drama. [3] (US)

**ENGL 3681. Twentieth-Century Drama.** [Formerly ENGL 286B] Topics in twentieth century drama drawn from the American, British, and/or world traditions. Formal structures of dramatic literature studied within contexts of performance, theatrical production, and specific dramatic careers. Authors may include O'Neill, Albee, Hansberry, Hellman, Stoppard, Wilson, and Churchill. Emphasizes British and world drama. [3] (US)

**ENGL 3683. Contemporary British Literature.** [Formerly ENGL 235] The novel, short story, and verse in Great Britain since World War II. [3] (HCA)

**ENGL 3692. Desire in America: Literature, Cinema, and History.** [Formerly ENGL 267] The influence of desire and repression in shaping American culture and character from the mid-nineteenth century to the present. [3] (US)

**ENGL 3694. America on Film: Art and Ideology.** [Formerly ENGL 268A] American culture and character through film, film theory, and literature. [3] (US)

**ENGL 3695. America on Film: Performance and Culture.** [Formerly ENGL 268B] Film performance in the construction of identity and gender, social meaning and narrative, public image and influence in America. [3] (US)

**ENGL 3710. Literature and Intellectual History.** [Formerly ENGL 214A] Fiction, poetry, and prose writings that represent overarching themes in English and/or American literature across conventional historical periods in order to define and trace their genealogy and evolution. [3] (HCA)

**ENGL 3711. Literature and Intellectual History.** [Formerly ENGL 214B] The emergence of modern consciousness in the nineteenth and twentieth centuries. [3] (HCA)

**ENGL 3720. Literature, Science, and Technology.** [Formerly ENGL 243] The relationship of science and technology to literature, film, and popular media. Focus on such topics as digital technology, genetics, and the representation of science in particular periods, genres, movements, and critical theories. Repeat credit for students who have completed 3720W. [3] (P)

**ENGL 3720W. Literature, Science, and Technology.** [Formerly 243W] The relationship of science and technology to literature, film, and popular media. Focus on such topics as digital technology, genetics, and the representation of science in particular periods, genres, movements, and critical theories. Repeat credit for students who have completed 3720. [3] (P)

**ENGL 3726. New Media.** [Formerly ENGL 259] History, theory, and design of digital media. Literature, video, film, online games, and other interactive narratives. [3] (HCA)

**ENGL 3728. Science Fiction.** [Formerly ENGL 242] Social and historical developments within the genre. Works from the late nineteenth century to the present. Cultural issues, including race, gender, sexuality, violence, and the representation of science. Repeat credit for students who have completed 3728W. [3] (P)

**ENGL 3728W. Science Fiction.** [Formerly ENGL 242W] Social and historical developments within the genre. Works from the late nineteenth century to the present. Cultural issues, including race, gender, sexuality, violence, and the representation of science. Repeat credit for students who have completed 3728. [3] (P)

**ENGL 3730. Literature and the Environment.** [Formerly ENGL 245] Environmental issues from British, American, and global perspectives. Methodological approaches such as ecocriticism, environmental and social justice, ethics, and activism. The role of literature and the imagination in responding to ecological problems and shaping environmental values. [3] (HCA)

**ENGL 3734. Literature and Law.** [Formerly ENGL 262] Study of the relationship between the discourses of law and literature. Focus on such topics as legal narratives, metaphor in the courts, representations of justice on the social stage. Repeat credit for students who have completed 3734W. [3] (HCA)

**ENGL 3734W. Literature and Law.** [Formerly ENGL 262W] Study of the relationship between the discourses of law and literature. Focus on such topics as legal narratives, metaphor in the courts, representations of justice on the social stage. Repeat credit for students who have completed 3734. [3] (HCA)

**ENGL 3736. Words and Music.** [Formerly ENGL 218] An investigation of works of literature that have inspired musical settings and the musical settings themselves. Emphasis on literary and musical analysis and interpretation. No musical background assumed. Repeat credit for students who have completed MUSL 2330. [3] (HCA)

**ENGL 3740. Critical Theory.** [Formerly ENGL 244] Major theoretical approaches that have shaped critical discourse, the practices of reading, and the relation of literature and culture. [3] (HCA)

**ENGL 3742. Feminist Theory.** [Formerly ENGL 246] An introduction to feminist theory. Topics include cross-cultural gender identities; the development of "masculinity" and "femininity"; racial, ethnic, class, and national differences; sexual orientations; the function of ideology; strategies of resistance; visual and textual representations; the nature of power. [3] (P)



**ENGL 3744. Advanced Poetry.** [Formerly ENGL 247] Formal analysis and close reading of major poems in the extended canon of British and American poetry. Related examples of historical, theoretical, and applied criticism. [3] (HCA)

**ENGL 3746. Workshop in English and History.** [Formerly ENGL 280] (Also listed as History 3746) Team-taught by a historian and an interdisciplinary scholar. Explores intersection of disciplines through close examination of texts in historical context. Preference to students majoring in the English-History program. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**ENGL 3748. Introduction to English Linguistics.** [Formerly ENGL 241] Systematic study of present-day English sounds, words, sentences, and the contexts of language production. Contemporary varieties of English. [3] (HCA)

**ENGL 3851. Independent Study.** [Formerly ENGL 289A] Designed primarily for majors. Projects are arranged with individual professors and must be confirmed with the director of undergraduate studies within two weeks of the beginning of classes; otherwise the student will be dropped from the 3851 rolls. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of ENGL 3851 and 3852] (No AXLE credit)

**ENGL 3852. Independent Study.** [Formerly ENGL 289B] Designed primarily for majors. Projects are arranged with individual professors and must be confirmed with the director of undergraduate studies within two weeks of the beginning of classes; otherwise the student will be dropped from the 3852 rolls. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of ENGL 3851 and 3852] (No AXLE credit)

**ENGL 3890. Movements in Literature.** [Formerly ENGL 272] Studies in intellectual currents that create a group or school of writers within a historical period. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3890W. Movements in Literature.** [Formerly ENGL 272W] Studies in intellectual currents that create a group or school of writers within a historical period. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3891. Special Topics in Creative Writing.** [Formerly ENGL 291] Advanced instruction in creative writing in emerging modes and hybrid genres. [3] (HCA)

**ENGL 3892. Problems in Literature.** [Formerly ENGL 273] Studies in common themes, issues, or motifs across several historical periods. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3892W. Problems in Literature.** [Formerly ENGL 273W] Studies in common themes, issues, or motifs across several historical periods. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3894. Major Figures in Literature.** [Formerly ENGL 274] Studies in the works of one or two writers with attention to the development of a writer's individual canon, the biographical dimension of this work, and critical responses to it. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3894W. Major Figures in Literature.** [Formerly ENGL 274W] Studies in the works of one or two writers with attention to the development of a writer's individual canon, the biographical dimension of this work, and critical responses to it. May be repeated for credit more than

once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3896. Special Topics in Investigative Writing in America.** [Formerly ENGL 287] Course will be taught by a distinguished visiting journalist from a major U.S. newspaper or magazine. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3; maximum of 6 credits total for all semesters of ENGL 287] (No AXLE credit)

**ENGL 3898. Special Topics in English and American Literature.** [Formerly ENGL 288] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3898W. Special Topics in English and American Literature.** [Formerly ENGL 288W] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

**ENGL 3899. Special Topics in Film.** [Formerly ENGL 269] Theory and practice of cinema as an aesthetic and cultural form. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3899] (HCA)

**ENGL 4960. Senior Year Capstone.** [Formerly ENGL 299] Topic chosen by the instructor. Prerequisite: 2200. [3] (No AXLE credit)

**ENGL 4998. Honors Colloquium.** [Formerly ENGL 290A] Background for writing the honors thesis. Emphasis on research methods, critical approaches, and the students' own projects. Limited to seniors admitted to the English Honors Program. [3] (No AXLE credit)

**ENGL 4999. Honors Thesis.** [Formerly ENGL 290B] Prerequisite: 4998. [3] (No AXLE credit)

## Environmental and Sustainability Studies

**ENVS 1001. Commons Seminar.** [Formerly ENVS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ENVS 4101. Seminar.** [Formerly ENVS 278] The relationship between society and the environment. Sustainability, adaptation, climate science, and policy. Open only to junior and senior ENVS minors. [3] (SBS)

**ENVS 4961. Special Topics.** Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

## European Studies

**EUS 1001. Commons Seminar.** [Formerly EUS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**EUS 2201. European Society and Culture.** [Formerly EUS 201] An interdisciplinary survey of European society, culture, and politics since 1900. [3] (INT)

**EUS 2203. The Idea of Europe.** [Formerly EUS 203] European identity from ancient ideals to its reality as the European Union. Emphasis on Europe as cultural construct and definable space. Historical, political, religious, philosophical, and cultural movements for Europe's claim to legitimacy. [3] (INT)

**EUS 2208. Conspiracy Theories and Rumors in European and U.S. History.** [Formerly EUS 208] From 1600 to the present. Jesuits, Jews, and the Illuminati. The American and French Revolutions, McCarthyism, UFOs, and New World Order theories. No credit for students who completed EUS 3890 section 1 in spring 2011. [3] (INT)

**EUS 2220. Religion and Politics in Modern Europe, 1648-Present.** [Formerly EUS 220] Toleration in the Enlightenment; the French Revolution; antisemitism; genocide; secularism and political Islam. [3] (INT)

**EUS 2240. Topics in European Studies.** [Formerly EUS 240] Topics of special interest on modern European culture or society. May be repeated for credit when topics vary. [3] (No AXLE credit)

**EUS 2260. European Cities.** [Formerly EUS 260] The history, politics, society, or culture of important European cities. Content varies according to location and disciplinary focus. The course is taught during the May Session in Europe with the cities themselves complementing daily lectures and site visits. Course requirements include preliminary work on campus, a research paper, and one or more examinations. May be repeated for credit in different cities. [3] (INT)

**EUS 2800. Pursuing Utopia: Social Justice & Romanticism in the Alps.** Social justice and literary experiments of writers who sought alternative approaches to art and society in the 'neutral' Alpine settings of Europe. [3] (INT)

**EUS 3850. Independent Readings and/or Research.** [Formerly EUS 289A] Independent readings and/or research on approved topics relating to modern European society and culture. [Variable credit: 1-3 each semester, maximum of 6 hours in 3850 and 3851 combined] (No AXLE credit)

**EUS 3851. Independent Readings and/or Research.** [Formerly EUS 289B] Independent readings and/or research on approved topics relating to modern European society and culture. [Variable credit: 1-3 each semester, maximum of 6 hours in 3850 and 3851 combined] (No AXLE credit)

**EUS 4960. Senior Tutorial.** [Formerly EUS 250] Supervised readings, joint discussions, and independent research on a modern European topic to be selected in consultation with the director of European Studies. Open only to juniors and seniors. [3] (No AXLE credit)

**EUS 4998. Senior Honors Research.** [Formerly EUS 299A] Open only to seniors who have been admitted to the European Studies departmental honors program. [3] (No AXLE credit)

## Financial Economics

**FNEC 1600. Financial Accounting.** [Formerly FNEC 140] Financial reporting and its relevance to the managerial environment. Financial statements from the perspectives of the preparer and the user. [3] (No AXLE credit)

**FNEC 2600. Managerial Accounting.** [Formerly FNEC 220] Selected topics in managerial accounting. No credit for graduate students. Prerequisite: 1600. [3] (SBS)

**FNEC 2700. Corporate Finance.** [Formerly FNEC 240] Investment and financial decisions faced by firms. Theoretical basis of corporate decision-making. Various accounting documents and the alternative objectives of firms, their management, and their owners. Attributes of firms that affect market value. How investment decisions and methods used by firms to finance these investments affect firm value. Prerequisite: 1600 and either ECON 1500, 1510, MATH 2820, PSY 2100, or PSY-PC 2101. [3] (SBS)

**FNEC 3700. Investment Analysis.** [Formerly FNEC 261] Investment principles and practices. Security analysis and valuation. Portfolio theory. Current issues in the financial sector. Stock market simulation. Prerequisite: 2700. [3] (SBS)

**FNEC 3705. Financial Management.** [Formerly FNEC 275] Analysis of cases representing capital budgeting, forecasting cash flow, risk assessment, capital structure, mergers and acquisitions. Seminar. Prerequisite: 2700. [3] (SBS)

**FNEC 3851. Independent Study in Financial Economics.** [Formerly FNEC 291A] A program of independent readings in financial economics arranged in consultation with an adviser. Prerequisite: written permission of an instructor and the program director. No credit for graduate students. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of FNEC 291a and 291b] (No AXLE credit)

**FNEC 3852. Independent Study in Financial Economics.** [Formerly FNEC 291B] A program of independent readings in financial economics arranged in consultation with an adviser. Prerequisite: written permission of an instructor and the program director. No credit for graduate students. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of FNEC 3851 and 3852] (No AXLE credit)

## French

**FREN 1001. Commons Seminar.** [Formerly FREN 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**FREN 1101. Introduction to French in the World.** [Formerly FREN 101A] Reading, writing, speaking, and listening through an exploration of the French-speaking world. For students who have studied little or no French. No credit for students who have earned credit for a more advanced French language course. [3] (No AXLE credit)

**FREN 1102. Introduction to French in the World.** [Formerly FREN 101B] Continuation of 1011. Study of the language through an exploration of the French-speaking world. No credit for students who have earned credit for a more advanced French language course. [3] (INT)

**FREN 1103. Accelerated Introduction to French in the World.** [Formerly FREN 102] Intensive course for students who have studied one to three years of French. No credit for students who have earned credit for 1101, 1102, or a more advanced French language course. [3] (INT)

**FREN 1111. First-Year Writing Seminar.** [Formerly FREN 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**FREN 2203. Contemporary Francophone Culture(s).** French and Francophone cultures through readings, film, and discussion. Designed for students who have completed elementary-level French. No credit for students who have earned credit for a more advanced French language course. Prerequisite: 1102 or 1103. [3] (INT)

**FREN 2501W. French Composition and Grammar.** [Formerly FREN 201W] Prerequisite: 2203 or the equivalent. No graduate credit. No credit for students who have earned credit for a more advanced French language course. [3] (INT)

**FREN 2550W. French Writing Workshop.** Intensive work with emphasis on development of sophisticated use of grammatical constructs. Offered only at Vanderbilt-in-France. [3] (INT)

**FREN 2611. Phonetics.** [Formerly FREN 203] Methodical comparison of French and English sounds. Correct formation of French sounds; oral exercises and aural training. Prerequisite: 2501W. [3] (INT)

**FREN 2614. Advanced Conversational French.** [Formerly FREN 214] Emphasis on idiomatic usage and strategies for oral communication. Prerequisite: 2501W. [3] (P)

**FREN 2891. Cross Cultural Communication.** Tools to build intercultural competencies in multicultural France. Integration with local culture and multicultural sensitivity. Offered only at Vanderbilt-in-France. Knowledge of French is not required. [3] (INT)

**FREN 3101. Texts and Contexts: Middle Ages to the Enlightenment.** [Formerly FREN 211] Literature and culture in historical contexts. Offered on a graded basis only. Prerequisite: 2501W. [3] (HCA)

**FREN 3102. Texts and Contexts: Revolution to the Present.** [Formerly FREN 212] Literature and culture in historical contexts. Offered on a graded basis only. Prerequisite: 2501W. [3] (HCA)

**FREN 3111. French for Business.** [Formerly FREN 204] Specialized vocabulary of business terms, business letters, and exercises in comprehension and translation. Prerequisite: 2501W. [3] (INT)

**FREN 3112. Medical French in Intercultural Contexts.** [Formerly FREN 205] Advanced conversation course dealing with medical issues in the Francophone world. Prerequisites: 2501W. [3] (HCA)

**FREN 3113. Advanced French Grammar.** [Formerly FREN 226] A systematic review with particular attention to morphology and syntax. Prerequisite: 2501W. [3] (INT)

**FREN 3180. La Provence.** [Formerly FREN 215] Geography, history, politics, architecture, and other cultural elements of Provence. Offered at Vanderbilt in France. Prerequisite: 2501W. [3] (INT)

**FREN 3181. Contemporary France.** [Formerly FREN 209] The culture of France today; social, economic, and political issues; literature and the arts. Offered at Vanderbilt in France. Prerequisite: 2501W. [3] (INT)

**FREN 3188. The Contemporary Press and Media.** [Formerly FREN 218] Analysis of newspapers and magazines through the comparative study of national and international issues in the press of the French-speaking world. Includes television broadcasts. Prerequisite: 2501W. Offered at Vanderbilt in France. [3] (P)

**FREN 3222. The Early Modern Novel.** [Formerly FREN 237] Development of the novel as a genre in the seventeenth and eighteenth centuries; its changing social, intellectual, and political context. Prerequisite: 2501W. [3] (HCA)

**FREN 3223. The *Querelles des femmes*.** [Formerly FREN 232] Debates around the status of medieval and Renaissance women, including the *Roman de la rose*. Alain Chartier, Christine de Pisan, the Des Roches, Montaigne, and Marie de Gournay. Prerequisite: 2501W. [3] (P)

**FREN 3224. Medieval French Literature.** [Formerly FREN 234] Thematic exploration of chronicles, romance, poetry, and theatre of medieval France and the history and culture that surrounded these literary productions. Prerequisite: 2501W. [3] (HCA)

**FREN 3230. French and Francophone Cinema.** [Formerly FREN 210] The themes and art of film in France and the French-speaking world. Offered in French at Vanderbilt in France and in English at Nashville. When offered in English, this course does not count toward the minor, and writing must be done in French to count toward the major. [3] (INT)

**FREN 3232. Introduction to Francophone Literature.** [Formerly FREN 222] The geopolitical, linguistic, and literary dimensions of the notion "La Francophonie." Readings will be chosen from fictional and nonfictional works from Africa, Canada, the Caribbean, countries bordering the Indian Ocean, and Vietnam. Prerequisite: 2501W. [3] (P)

**FREN 3233. Francophone Caribbean Literature.** [Formerly FREN 242] Major literary works of Haiti, Martinique, Guadeloupe, and French Guyana. Historical, geographic, and cultural context. Comparative approaches to the Hispanic and Anglophone Caribbean. Repeat credit for students who completed 294 section 1 in spring 2012. Prerequisite: 2501W. [3] (INT)

**FREN 3234. Contemporary Francophone Press.** [Formerly FREN 219] Critical study of the Francophone press (print, television, radio, internet) in Europe, Africa, Canada, Louisiana, Islands in the Caribbean and Indian Ocean (Madagascar, Seychelles). Current issues in the media. Comparisons with the U.S. press. Prerequisite: 2501W. [3] (HCA)

**FREN 3281. Provence and the French Novel.** [Formerly FREN 251] Images of Provence, its people, and their customs in novels of the nineteenth and twentieth centuries by Dumas, Zola, Giono, Pagnol. Offered at Vanderbilt in France. Prerequisite: 2501W. [3] (HCA)

**FREN 3286. Cultural Study Tour.** [Formerly FREN 216] Preparation for excursions; discussions, readings, and presentations. Offered each summer in the Vanderbilt in France program. [1] (No AXLE credit)

**FREN 3620. Age of Louis XIV.** [Formerly FREN 261] Literature and society in the reign of Louis XIV. Authors include Mme de Lafayette, La Fontaine, Molière, Pascal, Racine, and Mme de Sévigné. Prerequisite: 2501W. [3] (HCA)

**FREN 3621. Enlightenment and Revolution.** [Formerly FREN 260] Major writers of the eighteenth century, including Montesquieu, Voltaire, Rousseau, Diderot; literature of the Revolution. [3] (HCA)

**FREN 3622. From Romanticism to Symbolism.** [Formerly FREN 265] Nineteenth-century literature through its major movements: Romanticism, Realism, Naturalism, and Symbolism. Prerequisite: 2501W. [3] (HCA)

**FREN 3623. The Twentieth-Century Novel.** [Formerly FREN 238] The novel as a genre in the context of modernity and post modernity. Readings will focus on narrative techniques. Prerequisite: 2501W. [3] (HCA)

**FREN 3730. The Beat Generation's French Connection.** [Formerly FREN 266] The Beats' ties to Paris and to Quebec through French-Canadian Jack Kerouac. Antonin Artaud, Jean Genet, Arthur Rimbaud, and Marquis de Sade. No credit for students who earned credit for ENGL 288 section 3 in fall 2008 or ENGL 272 section 4 in spring 2010. Prerequisite: 2501W. [3] (INT)

**FREN 3788. Understanding the Maghreb.** [Formerly FREN 268] The North African Maghreb, its history and society. Novels, essays, documentaries, newspaper articles, and films. Offered at Vanderbilt in France. Prerequisite: 2501W. [3] (INT)

**FREN 3789. Francophone Literature and Film of the Maghreb.** [Formerly FREN 269] Literature, film, and their cultural context in Francophone North Africa. Offered at Vanderbilt in France. Prerequisite: 2501W. [3] (SBS)

**FREN 3850. Independent Study.** [Formerly FREN 289] Content varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available in the regular curriculum. May be repeated for a total of 12 credits over a four-semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of FREN 3850] (No AXLE credit)

**FREN 3880. Internship Training in France.** [Formerly FREN 287B] Under faculty supervision, students intern in public or private organizations, and complete research and readings. Offered on a pass/fail basis only and must be taken concurrently with 3881. Corequisite: 3881. [1] (No AXLE credit)

**FREN 3881. Internship Readings and Research in France.** [Formerly FREN 287A] Under faculty supervision, students intern in public or private organizations, and complete research and readings. Must be taken concurrently with 3880. Corequisite: 3880. [3] (No AXLE credit)

**FREN 3891. Special Topics in Traditions.** [Formerly FREN 294] Topics vary. Prerequisite: 2501W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**FREN 3892. Special Topics in Communications and Intersections.** [Formerly FREN 295] Topics vary. Prerequisite: 2501W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**FREN 4023. The African Novel.** [Formerly FREN 239] The postcolonial Francophone novel of Subsaharan Africa illustrating topics such as tradition and modernity, the identity of Africa, the representation of women, and the ideology of language. Prerequisite: 2501W. [3] (INT)

**FREN 4025. From Carnival to the "Carnavalesque".** [Formerly FREN 240] Carnival themes of transgression, the grotesque, feasting, and the "fool." Rabelais to contemporary works. Offered on a graded basis only. Prerequisite: 2501W. [3] (P)

**FREN 4027. Emile Zola: From Naturalist Novels to Social Activism.** [Formerly FREN 241] The author's method of researching subject matter and style of writing. "Environmental" influences of violence, prostitution, and alcoholism. The idea of the "public intellectual." Prerequisite: 2501W. [3] (HCA)

**FREN 4029. Twentieth-Century French Literature.** [Formerly FREN 267] Critical readings of representative works organized thematically with emphasis on their contextual and intertextual relationships. Prerequisite: 2501W. [3] (HCA)

**FREN 4030. French and Italian Avant-garde.** [Formerly FREN 271] Italian authors writing in French in the international and experimental atmosphere of Paris before World War I. D'Annunzio's "Le martyre de Saint Sébastien" to Marinetti's "Manifeste du Futurisme." Offered on a graded basis only. Prerequisite: 2501W. [3] (HCA)

**FREN 4221. Literature of the Fantastic.** [Formerly FREN 253] The theme of the fantastic in nineteenth- and twentieth-century prose fiction. Critical analysis using psychological and psychoanalytic concepts. Prerequisite: 2501W. [3] (HCA)

**FREN 4232. Literature and Law.** [Formerly FREN 252] Confessions, murder, argumentation, interpretation, and the representation of "the criminal" in literary and legal texts from traditional French writings. Offered on a graded basis only. Prerequisite: 2501W. [3] (P)

**FREN 4284. Art and Literature of the Nineteenth Century.** [Formerly FREN 224] Romanticism, realism, and symbolism in French art and literature. Prerequisite: 2501W. Offered at Vanderbilt in France. [3] (HCA)

**FREN 4285. Art and Literature of the Twentieth Century.** [Formerly FREN 225] Literary and artistic movements of the twentieth century in France. Prerequisite: 2501W. Offered at Vanderbilt in France. [3] (HCA)

**FREN 4320. French Feminist Thought: Literary and Critical.** [Formerly FREN 255] Feminist themes in twentieth-century French literature and criticism. Authors include Beauvoir, Duras, Sarraute, Irigaray, Cixous. Prerequisite: 2501W. [3] (P)

**FREN 4322. Adultery and Transgressions in Literature.** [Formerly FREN 272] Comparative and historical study of texts from the Middle Ages through the twentieth century. Offered on a graded basis only. Prerequisite: 2501W. [3] (P)

**FREN 4430. Jews & Arab-Muslims in France.** [Formerly FREN 258] Conflict between Jews and Arab-Muslims in France through analyses of historical accounts, news reports, and literary and cultural manifestations. From the origins of Zionism (~1885), to the Holocaust, and to the Intifadas of 1987 and 2000 and the Charlie Hebdo and kosher supermarket massacres of 2015 in Paris. Prerequisite 2501W. [3] (P)

**FREN 4432. French Intellectual History.** [Formerly FREN 256] From Montaigne to Sartre and beyond. Critical discourses and major philosophical texts. Prerequisite: 2501W. [3] (HCA)

**FREN 4998. Senior Honors Thesis.** [Formerly FREN 299A] [3] (No AXLE credit)

**FREN 4999. Senior Honors Thesis.** [Formerly FREN 299B] [3] (No AXLE credit)

## German

**GER 1001. Commons Seminar.** [Formerly GER 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**GER 1101. Elementary German I.** [Formerly GER 101] Development of the four language skills of reading, listening, speaking, and writing. No credit for students who have earned credit for a more advanced German language course. [3] (No AXLE credit)

**GER 1102. Elementary German II.** [Formerly GER 102] Continuation of 1101. No credit for students who have earned credit for a more advanced German language course. Prerequisite: 1101. [3] (INT)

**GER 1111. First-Year Writing Seminar.** [Formerly GER 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**GER 1482. Borders and Crossings: German Literature and Culture from Romanticism to the Present.** [Formerly GER 172] Textual and visual contributions to German culture from the nineteenth and twentieth centuries in English translation. Borders - physical, ideological, intellec-

tual, and metaphorical - and crossing these borders, as passages to more creative or liberated states of being, or as acts of transgress. Taught in English. [3] (HCA)

**GER 2066. Non-Equivalent Credit (German Content Program II).** [Formerly GER 72DT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the major or minor in GER as a German Content Program II course.

**GER 2201. Intermediate German I.** [Formerly GER 103] Intensive review of German grammar as a basis for reading, conversation, and composition. Texts and discussions address issues in contemporary German society. No credit for students who have earned credit for a more advanced German language course. Prerequisite: 1102. [3] (INT)

**GER 2202. Intermediate German II.** [Formerly GER 104] Practice in reading, listening, speaking, and writing. Short stories, one longer work (Kafka), and discussions examine aspects of modern life from a German perspective. No credit for students who have earned credit for a more advanced German language course. Prerequisite: 2201. [3] (INT)

**GER 2216. Business German.** [Formerly GER 216] The culture of the German business community; differences that hinder communication between German-speakers and non-German-speakers in the business setting; development of aural/oral and written skills. Business practices, policies, and laws in German-speaking countries; advertising and marketing strategies, letters, vitae, phone calls, and personal interviews. [3] (INT)

**GER 2217. Advanced Grammar.** [Formerly GER 220] Study of word formation and sentence structure in modern German, supplemented by contemporary readings, with discussion. Not open to students who have participated in the Regensburg exchange program. [3] (INT)

**GER 2281. Intensive German in Regensburg.** [Formerly GER 105] Grammatical and syntactic structures. Prerequisite: 2201; corequisite: 2282. [3] (No AXLE credit)

**GER 2282. Intensive German in Regensburg.** [Formerly GER 106] Landeskunde and communicative skills. Prerequisite: 2201; corequisite: 2281. [3] (No AXLE credit)

**GER 2310W. Introduction to German Studies.** [Formerly GER 201W] Literature, history, philosophy, and science of German-speaking countries presented through contemporary and multidisciplinary critical concepts and practices. Technology, theorizing mass culture, forms of cultural production, tradition and modernity. Reading and discussions in German. Prerequisite: 2202. [3] (INT)

**GER 2320. Conversation and Composition: Current Events.** [Formerly GER 213] Advanced German language course focusing on oral and writing proficiency. Topics on current events and societal developments. Prerequisite: 2202. [3] (INT)

**GER 2321. Conversation and Composition: Contemporary Culture.** [Formerly GER 214] Advanced German language course focusing on oral and writing proficiency. Topics on contemporary media and culture. Prerequisite: 2202. [3] (INT)

**GER 2341. German Culture and Literature.** [Formerly GER 221] Introduction to major periods and genres of German cultural production from the middle ages to the present; overview of major social and political developments. Literary, philosophical, and other texts. Readings and discussions in German. [3] (INT)

**GER 2342. German Culture and Literature.** [Formerly GER 222] Continuation of 2341. Introduction to major periods and genres of German cultural production from the middle ages to the present; overview of major social and political developments. Literary, philosophical, and other texts. Readings and discussions in German. [3] (INT)

**GER 2441. Great German Works in English.** [Formerly GER 183] German literature and culture from 1750 to present. The relationship of culture and history, changing notions of individual and community, modern sensibilities expressed in various genres. Goethe, Nietzsche, Freud, Kafka, and Jelinek. Knowledge of German not required. [3] (INT)

**GER 2442. War on Screen.** [Formerly GER 182] Representations of World War II and the fight against Nazi Germany in Hollywood and other

cinemas, contemporary video games, television, and installation art. How current modes of warfare and the global war on terror have changed the conventions of depicting war. [3] (HCA)

**GER 2443. German Cinema: Vampires, Victims, and Vamps.** [Formerly GER 270] An analysis of representative German film with special emphasis on its sociocultural and historical context. Discussion will include pertinent theories of cinematography and cinematic narration. Taught in English. [3] (INT)

**GER 2444. German Fairy Tales: From Brothers Grimm to Walt Disney.** [Formerly GER 244] The German fairy tale tradition and its role in American culture. Taught in English. [3] (INT)

**GER 2445. Nazi Cinema: The Manipulation of Mass Culture.** [Formerly GER 273] Nazi manipulation of mass culture through film (propaganda, musicals, westerns). Some comparison with American film of the era, additional examination of "fascist" aesthetic legacy in American culture today. No knowledge of German required. [3] (P)

**GER 3323. From Language to Literature.** [Formerly GER 223] Continuing practice in reading, listening, speaking, and writing; emphasis on literary terminology and techniques for critical reading of German. Recommended as preparation for more advanced literary study, prose, poetry, and drama. Prerequisite: 2320. [3] (HCA)

**GER 3343. The Aesthetics of Violence: Terror, Crime, and Dread in German Literature.** [Formerly GER 243] The "dark" side of imagination in twentieth-century German literature including history and theory of modern art, emphasis on literary representation, mutual influences between aesthetic reflection and political action. No knowledge of German required. [3] (P)

**GER 3344. Women at the Margins: German-Jewish Women Writers.** [Formerly GER 271] Examination of themes, forms, and sociocultural issues shaping the work of German-Jewish women writers from the Enlightenment to the present. Readings and discussions in English. [3] (HCA)

**GER 3345. Love and Friendship.** [Formerly GER 245] Concepts of life and friendship, Greek antiquity to Romanticism, modern and postmodern times. Philosophical and literary texts, letters, and essays. Taught in English. [3] (No AXLE credit)

**GER 3375. Art and Rebellion: Literary Experiment in the 1960s and 1970s.** [Formerly GER 275] German literature under the conditions of protest and rebellion. Experiments in poetry, prose, and theatre; new directions in art and media theory; historical influences. Taught in English. [3] (HCA)

**GER 3378. Dreams in Literature.** [Formerly GER 278] The difference between sleeping and being awake. Literary and philosophical texts. Novels, short stories, diaries, poems, and drama written within the last two hundred years. Prerequisite: 2202. [3] (HCA)

**GER 3851. Independent Readings.** [Formerly GER 289A] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for four semesters of GER 3851 and 3852] (No AXLE credit)

**GER 3852. Independent Readings.** [Formerly GER 289B] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for four semesters of GER 3851 and 3852] (No AXLE credit)

**GER 3890. Selected Topics.** [Formerly GER 294A] May be repeated for a total of 12 credits in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 12 credits total for all semesters of GER 3890 and 3891] (No AXLE credit)

**GER 3891. Selected Topics.** [Formerly GER 294B] May be repeated for a total of 12 credits in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 12 credits total for all semesters of GER 3890 and 3891] (No AXLE credit)

**GER 4535. German Romanticism.** [Formerly GER 235] The contributions of Schlegel, Tieck, Novalis, Eichendorff, and others to literature, philosophy, and theory. Intellectual, social, and political currents. [3] (INT)

**GER 4537. Women and Modernity.** [Formerly GER 237] Women in German literature from the eighteenth century to the present, focusing on questions of sexuality, political emancipation, artistic identity. No knowledge of German required. [3] (INT)

**GER 4548. German Lyric Poetry – Form and Function.** [Formerly GER 248] Lyric forms as a reaction to personal trauma, collective desire, scientific and technological advances, and social change since the Thirty Years' War. Love, loss, liberation. Students compose poems in imitation of classic examples of the folk song, ballad, sonnet. [3] (INT)

**GER 4550. Studies in Genre.** Main genres of German literature and culture. Relationship between genre and the social, political, and cultural developments that lead to a genre's formation and transformation. Prerequisite: 2202. [3] (HCA)

**GER 4560. Topics in Intellectual History.** Major trends and figures of German intellectual history, from the Enlightenment to the contemporary. Course may be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Knowledge of German is not required. Prerequisite: 2441. [3] (HCA)

**GER 4563. The Age of Goethe-Weimar 1775 to 1805.** [Formerly GER 263] Rational pragmatism, aesthetic innovation in response to Kant and French Revolution. Readings drawn from Goethe's *Iphigenia*, *Hermann und Dorothea*, Schiller's *Maria Stuart* and *Wallenstein*, and Wieland's *Oberon*. [3] (INT)

**GER 4564. Pleasures and Perils in Nineteenth-Century Theatre.** [Formerly GER 264] The German drama and dramatic theory from Romanticism up to Naturalism with emphasis on selected works by Kleist, Büchner, Grillparzer, and Hebbel. [3] (INT)

**GER 4565. Revolutionizing Twentieth-Century Theatre.** [Formerly GER 265] German drama and dramatic theory from Naturalism to the present. Emphasis on Brecht and post-Brechtian drama. [3] (INT)

**GER 4566. Nineteenth-Century Prose.** [Formerly GER 266] A study of representative works of the main literary trends from Romanticism to Naturalism. [3] (INT)

**GER 4567. The German Novel from Kafka to Grass.** [Formerly GER 267] A study and interpretation of the main literary trends and major figures in twentieth-century narrative. [3] (INT)

**GER 4569. Writing under Censorship.** [Formerly GER 269] An introduction to the main literary trends and authors of the former East Germany (1949-1989). [3] (HCA)

**GER 4574. Who Am I? German Autobiographies.** [Formerly GER 274] Canonical and non-canonical texts from the nineteenth and twentieth centuries constructing cultural, religious, and gender identities. Taught in English. [3] (HCA)

**GER 4576. Tales of Travel in Modern German Culture.** [Formerly GER 276] German curiosity about other cultures from the late eighteenth century to the present. The role of travel in German culture. The ways in which German poets, artists, and filmmakers have embraced different social and natural settings as sites of inspiration, self-discovery, and transformation. All readings and discussion in German. Prerequisite: 2310W. [3] (INT)

## Greek

**GRK 1101. Beginning Greek I.** [Formerly GRK 201] Classical Greek. Reading of simplified texts from authors of the fifth and fourth centuries BCE. No credit for students who have earned credit for a more advanced Greek language course. Graded basis only. [3] (No AXLE credit)

**GRK 1102. Beginning Greek II.** [Formerly GRK 202] Readings from classical authors. Introduction to Homeric and Hellenistic Greek. No credit for students who have earned credit for a more advanced Greek language course. Graded basis only. Prerequisite: 1101. [3] (INT)

**GRK 2201. Intermediate Greek I: Classical and Koiné Greek.** [Formerly GRK 203] Review of Greek grammar, and reading from classical and biblical texts. Prerequisite: 1102. No credit for students who have earned credit for a more advanced Greek language course. [3] (INT)

**GRK 2202. Intermediate Greek II: Homer's Iliad.** [Formerly GRK 204] Selected reading and interpretation; history and literary characteristics of the Homeric epic; practice in reading of meter. Prerequisite: 2201. No credit for students who have earned credit for a more advanced Greek language course. [3] (INT)

**GRK 3010. The Greek Orators.** [Formerly GRK 210] Classical Athenian orators, with a focus on Lysias and Demosthenes. Historical context, rhetorical technique, and prose style. Prerequisite: 2202. [3] (HCA)

**GRK 3020. The Greek Historians.** [Formerly GRK 212] Selections from the major Greek historians, especially Herodotus and Thucydides, and study of their philosophy of history; investigation of the development of historical prose writing. Prerequisite: 2201. [3] (HCA)

**GRK 3040. Readings in Plato and Aristotle.** [Formerly GRK 216] Selected readings from the dialogues of Plato and from the ethical writings of Aristotle. Corollary readings and discussions of the pre-Socratic philosophers and the post-Aristotelian schools. Prerequisite: 2202. [3] (HCA)

**GRK 3100. The Greek Tragedians.** [Formerly GRK 215] Selections from the plays of Aeschylus, Sophocles, and Euripides. Survey of the development of tragedy. May be repeated for credit with change of subject matter. Prerequisite: 2202. [3] (HCA)

**GRK 3110. Greek Lyric Poetry.** [Formerly GRK 218] The Greek melic, elegiac, and iambic traditions, with an introduction to the Greek dialects and special emphasis on Archilochus, Tyrtaeus, Alcaeus, and Sappho. Prerequisite: 2202. [3] (HCA)

**GRK 3200. Early Christian Writers.** [Formerly GRK 240] Writings from the New Testament to critical works and letters by the Cappadocian fathers. Historical and intellectual context. Rhetoric and style. The Roman East. Prerequisite: 2201. [3] (HCA)

**GRK 3850. Independent Study.** [Formerly GRK 289] Designed for majors wanting to familiarize themselves with works and authors not covered in the regular curriculum. Prerequisite: 6 hours above 2202. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of GRK 3850] (No AXLE credit)

**GRK 3890. Special Topics in Greek Literature.** [Formerly GRK 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

## Haitian Creole Language

**CREO 1101. Elementary Creole I (Duke).** Haitian Creole or Kreyòl language. Vocabulary and idioms. Haitian culture. Understanding, speaking, reading, and writing in contexts of health care, Haitian women's rights, and unpaid child servants (restavèk). Offered on a graded basis only. [3] (No AXLE credit)

**CREO 1102. Elementary Creole II (Duke).** Essential elements of Creole language and aspects of Haitian culture. Speaking, listening, reading, and writing. Exposure to Haitian culture through films, storytelling, games, music, and proverbs. Prerequisite: 1101 or a comparable level of previous

Creole language experience, such as familial background in Creole. Offered on a graded basis only. [3] (INT)

**CREO 2201. Intermediate Creole I (Duke).** Understanding, speaking, reading, and writing in cultural context; issues of rural life in Haiti, religion, Frenchified Creole vs popular Creole. Texts, poems, novel excerpts. Focus on contemporary events and debates in Haitian culture. Offered on a graded basis only. Prerequisite: 1102. [3] (INT)

**CREO 2202. Intermediate Creole II (Duke).** Second semester of Intermediate Creole. Offered on a graded basis only. Prerequisite: 2201 or equivalent. [3] (INT)

## Hebrew

**HEBR 1101. Elementary Hebrew.** [Formerly HEBR 111A] Introduction to alphabet, the basics of grammar, and elementary conversation. Classes meet three times per week with an additional two hours a week required in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. [4] (No AXLE credit)

**HEBR 1102. Elementary Hebrew.** [Formerly HEBR 111B] Continuation of 1101. Greater stress upon conversation and grammar. Classes meet three times a week with an additional two hours a week required in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 1101. [4] (INT)

**HEBR 2201. Intermediate Hebrew.** [Formerly HEBR 113A] Introduction to modern Hebrew reading, conversation, advanced grammar, and conversation. Classes meet three times a week with an additional three hours a week spent in independent work in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 1102. [3] (INT)

**HEBR 2202. Intermediate Hebrew.** [Formerly HEBR 113B] Continuation of 2201. Greater emphasis on reading and writing. Classes meet three times a week with an additional three hours a week spent in independent work in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 2201. [3] (INT)

**HEBR 2301. Advanced Hebrew Grammar.** [Formerly HEBR 201] Emphasis on syntax and grammar supplemented by listening, speaking, and reading. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 2202. [3] (INT)

**HEBR 2302W. Advanced Hebrew Composition.** [Formerly HEBR 202W] Development of writing skills through the study of short stories, poems, articles, television, and web materials. Prerequisite: 2301. [3] (INT)

**HEBR 3851. Independent Study in Modern Hebrew.** [Formerly HEBR 289A] May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total in HEBR 3851 and 3852] (No AXLE credit)

**HEBR 3852. Independent Study in Modern Hebrew.** [Formerly HEBR 289B] May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total in HEBR 3851 and 3852] (No AXLE credit)

## Hindi-Urdu

**HNUR 1101. Elementary Hindi-Urdu I.** Speaking-listening skills and basic grammar. Introduction to reading and writing in Devanagari (Hindi) and Nastaliq (Urdu) scripts and to South Asian cultural materials. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. [5] (No AXLE credit)

**HNUR 2201. Intermediate Hindi-Urdu I.** Conversational skills, writing, vocabulary, and grammar. Reading texts in Devanagari (Hindi) and Nastaliq (Urdu) scripts. Discussion of cultural materials in Hindi-Urdu. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. Prerequisite: 1102. [5] (INT)

## History

**HIST 1001. Commons Seminar.** [Formerly HIST 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**HIST 1050. East Asia since 1800.** [Formerly HIST 105] Traditional orders in China, Japan, Korea, and Vietnam. Encroachment of European empires. Nineteenth- and twentieth-century social and political revolutions. Japanese imperialism and the invention of pan-Asianism. WWII in the Pacific; the rise and persistence of Communism. East Asia as a new center of the global economy in the twenty-first century. [3] (INT)

**HIST 1060. Premodern China.** [Formerly HIST 106] The development of Chinese civilization from ancient times to the seventeenth century. The birth and development of the Chinese identity; Confucianism, Taoism and Buddhism; the moral, military, and bureaucratic foundations of the imperial institution; the Silk Road; eunuchs and concubines; the commercial revolution. [3] (INT)

**HIST 1070. China from Empire to the People's Republic.** [Formerly HIST 107] From the seventeenth century to the present. The establishment and expansion of the Qing empire and its clashes with European empires. Twentieth-century revolutions and war with Japan. Mao and the making of the Communist state; post-Mao economic and social reforms. Tibet and ethnic minority issues. [3] (INT)

**HIST 1080. Premodern Japan.** [Formerly HIST 108] Japanese civilization from ancient times to the Meiji Restoration (1868). Connections between culture and politics; relations with neighboring regions in East Asia. [3] (INT)

**HIST 1090. Modern Japan.** [Formerly HIST 109] The political, social, economic, and cultural history of Japan in the nineteenth century to the present. Radical changes in the state, society, and economy and the effects of these changes on Japan's place in the world. [3] (INT)

**HIST 1111. First-Year Writing Seminar.** [Formerly HIST 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**HIST 1160. Modern South Asia.** [Formerly HIST 116] Early modern South Asia to British imperialism and the independence of India and Pakistan. Colonial society, political movements, caste, gender, and religious "reform." Mass nationalism and Gandhi, religious conflict, and the partition of India and Pakistan. Debates on history and memory. [3] (INT)

**HIST 1190. A History of Islam.** [Formerly HIST 119] Origins to the present, with emphasis on the modern era. Early and medieval Islam, modernism and fundamentalism. Arabia and the Wahhabis, Iran and Shi'ism, South Asian syncretism, Muslim minorities in Western Europe and the United States. Recent Islamic views on human rights, science, economics, and other religions. [3] (INT)

**HIST 1200. The Arab Spring.** [Formerly HIST 120] Roots of the movement and the course of events. The role played by the West and by print and other media. Ideologies throughout the Islamic world. Prospects for the future. [3] (INT)

**HIST 1270. Sub-Saharan Africa: 1400-1800.** [Formerly HIST 127] Pre-colonial history of West and Central Africa. The rise of early empires; cultural history of major groups, the spread of Islam; the Atlantic exchange, development of the Atlantic plantation complex, and the slave trade. [3] (INT)

**HIST 1280. Africa since 1800: The Revolutionary Years.** [Formerly HIST 128] Political, economic, and social patterns in Sub-Saharan Africa from 1800 to the present. The transition from traditional states and societies, through the colonial interlude and the quest for independence to the modern national setting with its problems of development. Emphasis on the peoples of Nigeria and South Africa. [3] (INT)

**HIST 1350. Western Civilization to 1700.** [Formerly HIST 135] Judeo-Christian and Greco-Roman foundations to the beginning of the eighteenth century. [3] (INT)

**HIST 1360. Western Civilization since 1700.** [Formerly HIST 136] European history from the age of the Enlightenment to the present day. [3] (INT)

**HIST 1365W. How to Start Your Own Country: Sovereignty and State-Formation in Modern History.** Seventeenth century to present. Sovereignty, statehood, and state-formation. Case studies of the Spanish Empire, British East India Company, Hong Kong, Guantanamo Bay Naval Station, and Disney World. Offered on a graded basis only. [3] (INT)

**HIST 1370. Colonial Latin America.** [Formerly HIST 137] Survey of Latin American history from pre-Columbian times to the early nineteenth century. Iberian, Amerindian and African background; the conquest; construction of colonial society and institutions; wars for independence. [3] (INT)

**HIST 1380. Modern Latin America.** [Formerly HIST 138] A survey of Latin American history from the early nineteenth century to the present. Wars for independence; rise of new nations and export-oriented economies; case studies in revolution, nationalism, and reform in the twentieth century; U.S.-Latin American relations. [3] (INT)

**HIST 1383. Slave Resistance in the Americas.** Resistance across North and South America. Slave flight, marronage, and full-blown rebellion. Free black towns in Florida, Mexico, Panama, and Colombia created by former slaves. Problems of evidence and voice through primary sources of free and enslaved Africans and their descendants. Sources by historians and archaeologists. Art and material culture of rebels. Offered on a graded basis only. [3] (INT)

**HIST 1385W. Disease and Disorder in the Atlantic World.** Spanish Atlantic from Columbus through the Haitian Revolution. Smallpox, slavery, and rebellion. [3] (INT)

**HIST 1390. America to 1776: Discovery to Revolution.** [Formerly HIST 139] North American colonies from the Iberian Atlantic dominion through the zenith of the British Empire. The impact of the European quest for empire on Native American and West African societies. The emergence of colonial North America within the context of European imperial rivalries and Native American political and economic networks. [3] (US)

**HIST 1395. The Underground Railroad.** Runaway slaves and their assistance from free blacks, whites, and other slaves. Impact on the course of slavery. Mechanisms of slave holders to capture and return the enslaved. Offered on a graded basis only. [3] (US)

**HIST 1400. U.S. 1776-1877: Revolution to Civil War and Reconstruction.** [Formerly HIST 140] Independence and establishment of new political institutions. Westward expansion, economic expansion, formation of a distinctive American culture. Development of mass party politics, evangelical Protestantism, and reform movements. Sectional conflict over slavery, Civil War; Reconstruction, and the dawn of the Gilded Age. No credit for students who earned credit for 170 prior to fall 2008. [3] (US)

**HIST 1410. U.S. 1877-1945: Reconstruction through World War II.** [Formerly HIST 141] Economic, political, and social history during the era of industrialization, mass immigration, the rise of mass culture, the Great Depression, and the two world wars. [3] (US)

**HIST 1420. U.S. Post-1945: Cold War to the Present.** [Formerly HIST 142] Political, international, social, and cultural currents that have shaped contemporary America. [3] (US)

**HIST 1425W. Body, Mind, and Soul: Elvis, Dylan, Springsteen and Postwar America.** Rock and roll's transformation of American culture. Focus on three pivotal artists and their role in the history of each of their breakout decades: the 1950s, 1960s, and 1970s. Readings and listenings on the African American roots of rock, the gendered dimensions of the genre, the role of dissent and accommodation in popular music. Issues of youth, alienation, religion, and individuality. [3] (US)

**HIST 1440. African American History since 1877.** [Formerly HIST 144] The political, socioeconomic, and intellectual history of African American people from the end of Reconstruction to the present. Special emphasis

on African American cultural and institutional history and the twentieth-century protest movements. [3] (US)

**HIST 1470. History of Exploration.** [Formerly HIST 147] Antiquity to the present. Voyages of discovery, including land expeditions and exploration of extreme depths, high altitudes, and outer space. Technologies of travel and measurement. Voyaging as exploration of the self. Cultural shifts as consequences of encounters with new places and peoples. [3] (INT)

**HIST 1480. The Darwinian Revolution.** [Formerly HIST 148] Intellectual structure and social context of evolutionary ideas from 1700 to the present. Pre-Darwinian evolutionary theories. Darwin's life and work. Racial theories and eugenics. Comparative reception of Darwinism in the United States and Europe. Conflict between science and religion. [3] (P)

**HIST 1500. History of Modern Sciences and Society.** [Formerly HIST 150] The end of the Scientific Revolution to the present. Sciences arising from the fields of Natural Philosophy (physics, astronomy, mathematics, and chemistry) and Natural History (geology and the life sciences). The clockwork universe, atomism and the Chemical Revolution; evolutionary theory (physical, geological, and biological); thermodynamics; and quantum theory. Colonial empires, industry, professional specialization, cultural modernism, and nuclear fear. [3] (P)

**HIST 1510. The Scientific Revolution.** [Formerly HIST 151] The production and dissemination of knowledge of the natural world during the period of the Scientific Revolution, covering roughly from 1450 to 1700. Cosmology and astrology, navigation, alchemy, religion and philosophy, and medicine. [3] (P)

**HIST 1510L. Scientific Revolution Digital History Lab.** Optional lab accompanying HIST 1510. Digital history tools and building digital projects. Prerequisite or corequisite: 1510. [1] (No AXLE credit)

**HIST 1520. Science and the Sea.** Histories of science and environment. Effect of science on our conception of the ocean; effect of working at sea on our practice of science. Navigators' travel journals, oceanographers' reports, and recent writings by historians of ocean science. [3] (P)

**HIST 1580. Crime and Punishment in Early Modern Europe 1400-1800 CE.** [Formerly HIST 158] Changing definitions of crime, the classification of criminals, and the nature of punishment. "Real" crimes such as vagrancy, theft, and murder; imaginary crimes such as Jewish ritual murder and witchcraft. Connections with long-term social, legal, and cultural transformations. [3] (HCA)

**HIST 1582W. Witchcraft, Supernatural Phenomena, and Print Culture in England, 1558-1650.** Role of printed broadsides, woodcuts, pamphlets, and treatises in spreading and influencing ideas about the supernatural. Responses to demonic possession, "monstrous" events, and magic. Social, legal, cultural, and religious contexts. Influence of expectations about gender and class. Development of theological and skeptical views. [3] (INT)

**HIST 1600. European Economic History, 1000-1700.** [Formerly HIST 160] From the commercial revolution of High Middle Ages to Industrial Revolution. Interconnections of economic forces with politics, society, and cultures. Rise of long distance trade; development of business and accounting techniques; public finance; monetary trends; advent of capitalist ethic. [3] (SBS)

**HIST 1640. History of American Capitalism.** [Formerly HIST 164] The development of American capitalism from the colonial period to the twenty-first century. The reasons for and effects of capitalist growth; the ways in which a largely agrarian society emerged as an industrial and commercial leader and shaped the ways Americans produced and lived. The political, social, and cultural dimensions of economic change. The global context of American development. Serves as repeat credit for students who completed 294 section 3 in spring 2011. [3] (US)

**HIST 1650. The Foreign Expansion of American Banking.** [Formerly HIST 165] The movement of American banking institutions abroad from 1893 to the present. Foreign loans and sovereign debt, dollar diplomacy and imperialism, international branch banking and trade financing, money laundering and off-shore accounting, political economy and globalization. [3] (US)

**HIST 1660. American Enterprise.** [Formerly HIST 166] Evolution of the form, organization, and structure of the American business firm from colonial times to the present. Entrepreneurs, labor management, financial capital, distribution, invention, and government regulation. [3] (US)

**HIST 1665. Capital, Labor, and Democracy in the United States.** Nineteenth century to present. Tensions and connections between capitalism and democracy. Basic introduction to the social and political history of workers, business, politics, and organized labor. Questions of power and economic inequality as expressed in American political culture. [3] (US)

**HIST 1690. Sea Power in History.** [Formerly HIST 169] U.S. Navy's role in foreign and defense policies from the American Revolution to the present. Broad principles, concepts, and elements of sea power throughout history. Technological advances, interservice relations, strategies, and governmental policies pertaining to sea power. Designed to meet the NROTC requirement. Offered on a graded basis only. No credit for students who have earned credit for NS 131. [3] (US)

**HIST 1691. Evolution of Warfare.** [Formerly HIST 169C] Antiquity to the present. Evolution of strategic principles. Influence of technological, economic, moral, psychological, and political factors. Case studies from a soldier's perspective. Repeat credit for students who have completed NS 2311. [3] (No AXLE credit)

**HIST 1693. Fundamentals of Maneuver Warfare.** [Replaces HIST 1692 Amphibious Warfare] Broad aspects of warfare and their interactions with maneuver warfare doctrine. Focus on the United States Marine Corps as the premier maneuver warfare fighting institution. Historical influences on current tactical, operational, and strategic implications of maneuver warfare practices. Case studies. Enrollment preference to NROTC students. Repeat credit for students who have completed HIST 169D or HIST 1692. [3] (No AXLE credit)

**HIST 1700. Western Military History to 1815.** [Formerly HIST 170] War in culture, politics, and society; technology, the Military Revolution and state-formation. [3] (INT)

**HIST 1730. The U.S. and the Cold War.** [Formerly HIST 173] U.S. history, 1945-1991. Emphasis on foreign policy and competition with Soviet Union. Impact of Cold War on American society. [3] (US)

**HIST 1740. The U.S. and the Vietnam War.** [Formerly HIST 174] Origins of American involvement, the reasons for escalation, and the Vietnamese response to intervention. The impact on America's domestic politics, the growth of the anti-war movement, and the economic, social, and cultural effects of the conflict. [3] (US)

**HIST 1760. History of Christian Traditions.** [Formerly HIST 176] Origins to the present. Jewish origins, formation of a Catholic tradition, church-state relations, and the social and cultural contexts of changing Christian beliefs and practices. [3] (HCA)

**HIST 1770. United States' Religious History.** Religion's influence on the body politic and culture of society. Readings from several religious communities. How race, gender, and ethnicity shape religious identity. [3] (US)

**HIST 1780W. Self and Society in the United States.** Selfhood and identity development from the early Republic to the present. The role of race, class, and gender but also religion, politics, work, technology, and media in shaping selves in the United States. Readings include autobiographies, fiction, etiquette manuals, advertisements, and scientific tracts. Offered on a graded basis only. [3] (HCA)

**HIST 1881. The Body in Modern Japanese Culture.** [Formerly HIST 188A] The roles of human bodies and body image in the making of modern Japan. Bodies as a means of understanding the past and the present. Individuals, society, culture, and physical environment. Historical and literary writings and film from the twentieth century. [3] (INT)

**HIST 1882W. Japan Through Historical Fiction.** Premodern and modern history of Japan through works of Japanese historical fiction. Culture, religion, and society. Relationship between history and literature. [3] (INT)



**HIST 2100. Politics and Catastrophe in Modern China.** [Formerly HIST 202] Influence of politics on culture, society, government, and the military. The Cultural Revolution to Tiananmen Square. [3] (INT)

**HIST 2105. Chinese Thought.** [Formerly HIST 203] Confucianism and Philosophical Daoism. The Confucian Four Books, the Daodejing (Laozi), Zhuangzi, and Neo-Confucianism. [3] (INT)

**HIST 2110. Crisis Simulation in East Asia.** [Formerly HIST 204] Strategic motivations and behaviors of international actors. Simulations of the decision-making process during critical historical moments in the East Asian context through role-playing and video games. Offered on a graded basis only. [3] (INT)

**HIST 2115. Play and Pleasure in Early Modern Japan.** [Formerly HIST 205] Cultural history of Tokugawa Japan (1603-1868), with emphasis on daily life and popular entertainment in the capital of the warrior government, Edo (present-day Tokyo). Woodblock prints, pleasure quarters, kabuki theatre, commoner carnivals, and popular literature. [3] (INT)

**HIST 2119. The Pacific War in Cinematic Memory.** Cinematic representations of the Pacific Theater in World War II. Formal and historical analyses. Film's role in shaping war memories. [3] (INT)

**HIST 2120. Japan's War and Postwar, 1931-1989.** [Formerly HIST 206] Japan's war in Asia and the Pacific in the mid-twentieth century and its legacies. The effect of defeat on the nation; reconstruction efforts and economic success. Hirohito's death. [3] (INT)

**HIST 2130. Russia: Old Regime to Revolution.** [Formerly HIST 209] Russian history from the early nineteenth-century old regime through the Russian Revolution of 1917. Culture, society, and serfdom; the Great Reforms, ideology, and radicalism; industrialization; modernity in an agrarian society; twentieth-century revolutions. [3] (INT)

**HIST 2135. Russia: The U.S.S.R. and Afterward.** [Formerly HIST 210] Russian history since the 1917 Revolution. Overview of the old regime; revolution and civil war; the Soviet "Roaring '20s"; Stalinism and the totalitarianized society; World War II. Postwar Soviet society and culture; de-Stalinization and the sixties generation; Gorbachev, perestroika, and disintegration; contemporary history. [3] (INT)

**HIST 2137. The Mandelas: Biography, Struggle, and Legacies.** [Formerly HIST 211] Personal and political biographies of Nelson and Winnie Mandela. Their childhood, upbringing, education, professional and personal lives. Their legacies and lessons as global human rights icons through the anti-apartheid struggle, arrest, trials, imprisonment, freedom, presidency, and reconciliation. [3] (INT)

**HIST 2138. Blood Diamonds, Blood Oil, Commodities, and Conflicts in Africa.** 1870s to the present. Role of diamonds, gold, rubber, and oil in the resulting conflicts in modern Africa. Multinationals, mineral extraction, and politics. Poverty, war, child labor, and corruption. Local and international mining and mineral syndicates. Implications for Africans and their livelihoods. [3] (INT)

**HIST 2140. The Mughal World.** [Formerly HIST 211A] Mughal history from 1500-1750. The early modern world and Islamic empires. Akbar and Hindu-Muslim interactions in South Asia. Oriental despotism and the idea of the monarch. Gender and authority. English, Dutch, and Portuguese views. Trade and the decline of Mughal authority. Globalization, the rise of Indian entrepreneurs, and the East India company. [3] (INT)

**HIST 2145. Religion and Politics in South Asia.** [Formerly HIST 211B] From pre-modern times to the present. The formation of religious identities in South Asia, including India, Pakistan, and Bangladesh. Religious and political identity during British colonialism. Post-1947 South Asian politics and debates on religious freedom and conflict. Offered on a graded basis only. [3] (INT)

**HIST 2150. India and the Indian Ocean.** [Formerly HIST 212A] Cultures along the Indian Ocean coastline from Roman times to 1800, especially South Asia. Coastal societies and politics, Islam, pilgrimage and trade, economic zones, and cultural ties. Pirates, seafarers and merchants; diasporas and genealogies. The entry of European trading companies and debates on trade and empire. [3] (INT)

**HIST 2155. Muhammad and Early Islam.** [Formerly HIST 213] Early Arabian society, Judaism and Christianity in Arabia; Muhammad and the birth of Islam, the conquests, Islamization, Arabization; Jewish influences in early Islam, the medieval Islamic world. [3] (INT)

**HIST 2160. Medicine in Islam.** [Formerly HIST 216] Emergence of medicine in the Islamic world. Links with other traditions. Doctors and society; conventional medical practice in hospitals; prophetic medicine; Jewish and Christian doctors in Islam; pharmacology; developments in the nineteenth-century. No credit for students who have earned credit for 1111 section 21. [3] (INT)

**HIST 2170. Islam and the Crusades.** [Formerly HIST 217] Ideology; successes and failures; history and character of Crusader enterprises in the Holy Land and elsewhere. Muslim religious, political, ideological, and social reactions. Islamic culture and the West; relations among Crusaders, Muslims, and Jews. [3] (P)

**HIST 2180. Islamic Narratives: Narratives of Islam.** History and historiography in Arab Islam. Aims and uses of historical writing in the religious context. Comparison with other pre-modern cultures. Islamic and non-Islamic sources for Islamic history. Examples from the ancient world, early Islam, Middle Ages, and the political entity known as the Islamic State. [3] (HCA)

**HIST 2190. Last Empire of Islam.** [Formerly HIST 219] The Ottoman "long nineteenth century," 1789 to 1923. The Reforms (Tanzimat), state patriotism, intercommunal relations, national "awakenings," and the emergence of a public sphere. Historiographical issues, such as perceptions of the empire as the "Sick Man of Europe" and debates over its decline. [3] (INT)

**HIST 2220. Medieval and Renaissance Italy, 1000-1700.** [Formerly HIST 222] Transformation of Italy from "medieval" society to the "Renaissance." Cultural, economic, and social developments, especially connections among wealth, status, and patronage. Meaning and applicability of the term "Renaissance." [3] (HCA)

**HIST 2230. Medieval Europe, 1000-1350.** [Formerly HIST 223] Economic expansion and the formation of national states; the medieval Church and the revival of learning in the twelfth and thirteenth centuries. [3] (INT)

**HIST 2250. Reformation Europe.** [Formerly HIST 225] The political, intellectual, and social conditions underlying the Protestant revolt. The Reformation of Luther, Calvin, Zwingli, Loyola, and other religious reformers considered within the context of the general developments of sixteenth-century history. [3] (INT)

**HIST 2260. Revolutionary Europe, 1789-1815.** [Formerly HIST 226] Political, cultural, and economic upheavals in the late eighteenth and early nineteenth centuries; the French Revolution and Napoleon, romanticism, and early industrialization. Emphasis on Britain, France, and Germany. [3] (INT)

**HIST 2270. Nineteenth-Century Europe.** [Formerly HIST 227] Major political, social, economic, and cultural developments from 1815 to 1914. [3] (INT)

**HIST 2280. Europe, 1900-1945.** [Formerly HIST 228] Political, socio-economic, cultural, and colonial history of Europe from 1914 to the fall of Hitler. [3] (INT)

**HIST 2290. Europe since 1945.** [Formerly HIST 229] Origins of the Cold War; political and social transformations, East and West; the breakup of colonial empires; ideological and military tensions; intellectual and cultural trends. [3] (INT)

**HIST 2295. The Migrant Crisis in the Netherlands.** From the eighteenth century to the present. Political, economic, social, cultural, and religious history of interactions between Dutch people and migrants in the Netherlands. Migration and identity. Special attention to developments concerning Muslims in a changing Europe. Offered on a graded basis only. [3] (INT)

**HIST 2300. Twentieth-Century Germany.** [Formerly HIST 230] The turbulent history of Germany, as it went from authoritarian state to volatile democracy, to National Socialist dictatorship, to divided country, and to reunification. Special emphasis placed on the Nazi dictatorship, its origins and legacy. [3] (INT)

**HIST 2310. France: Renaissance to Revolution.** [Formerly HIST 231] Social and cultural history from 1515 to 1815. Conditions of life, ambitions, ideas, and tastes of the various social groups. Development of arts, music, and literature in a sociopolitical context. Causes and consequences of the French Revolution of 1789. [3] (INT)

**HIST 2340. Modern France.** [Formerly HIST 234] The fall of Napoleon in 1815 to the present. Emphasis on politics. Major economic, social, cultural, and intellectual developments. [3] (INT)

**HIST 2380. Shakespeare's Histories and History.** [Formerly HIST 238] Readings from a variety of plays by Shakespeare and his contemporaries. Significant political and cultural issues from the 1590s in early English history. No credit for students who earned credit for 294 section 2 in fall 2008. [3] (HCA)

**HIST 2382. The Rise of the Tudors.** [Formerly HIST 239B] Causes and course of the political crisis in the fifteenth century and the rise of the Tudor monarchy. Political and religious forces that drove the English Reformation and its immediate consequences. No credit for students who have completed 2385. [3] (HCA)

**HIST 2383. A Monarchy Dissolved? From Good Queen Bess to the English Civil War.** [Formerly HIST 239C] Creation of political stability out of the turmoil caused by the English Reformation and its dissolution only forty years later. The relationship between religion and politics, state and society. No credit for students who have earned credit for 3260. [3] (HCA)

**HIST 2385. The Real Tudors.** [Formerly HIST 239A] Marital, dynastic history of the Tudors in relation to religious and political change through and after the English Reformation. Court politics, ideological conflict, and the rise of an increasingly confessionalized international politics. Offered on a graded basis only. [3] (HCA)

**HIST 2410. Victorian England.** [Formerly HIST 241] Cultural values, liberal reform; urbanization; women and gender; imperialism. [3] (INT)

**HIST 2450. Reform, Crisis, and Independence in Latin America, 1700-1820.** [Formerly HIST 245] Reorganization of the Spanish and Portuguese empires; maturation of transatlantic societies; and revolutions for independence. [3] (INT)

**HIST 2457. Drug Trafficking and Society in Latin America.** Narcotics trafficking between Latin America and the United States. Complexities of production, transport, and trade. U.S. drug policy and politics. The 'drug war'. Violence, social problems, and political issues related to drugs in Latin America. Representation of the drug trade and drug culture. [3] (INT)

**HIST 2470. Revolutionary Mexico.** [Formerly HIST 247] Revolutionary politics and radical expression in 20th century Mexico. Causes of popular unrest; violent political change; post-conflict state-building; government attempts to alter popular culture; radical muralism and graphic art; revolutionary expression and gender; literature and disenchantment. [3] (INT)

**HIST 2480. Central America.** [Formerly HIST 248] Iberian and Amerindian background, colonial society; independence; growth of the plantation economy; the U.S. presence; political and social revolutions in the twentieth century. [3] (INT)

**HIST 2490. Brazilian Civilization.** [Formerly HIST 249] From pre-Columbian times to the present. Clash and fusion of Portuguese, Amerindian, and African cultures; sugar and slavery; coffee and industrialization; race relations; dictatorship and democracy in the twentieth century. [3] (INT)

**HIST 2510. Reform and Revolution in Latin America.** [Formerly HIST 251] Comparative analysis of revolutions and reform movements in twentieth-century Latin America focusing on land tenure, social classes, political culture, economic structures, and foreign influences. [3] (INT)

**HIST 2530. African Religions in Americas.** [Formerly HIST 253] An interdisciplinary study of Islam, Christianity, and Animist religions in pre-colonial Africa; their transformation and practice in the Americas. Case studies of Brazil, Cuba, and the American South. Material culture studies and visits to local museum exhibits. [3] (INT)

**HIST 2535. Latin America and the United States.** [Formerly HIST 253A] The complicated relationship between Latin America and the United States from the early nineteenth century to the present. Role of ideology,

national security, economic interests, and cultural factors in shaping inter-American affairs. [3] (INT)

**HIST 2540. Race and Nation in Latin America.** [Formerly HIST 254A] Late nineteenth century to the present. Social, political, and cultural constructions of belonging. Citizenship and state building. Immigration, education, urbanization, civil and international wars, and gender and sexuality. Case studies draw from the Andes, Spanish Caribbean, Southern cone, and Brazil. Serves as repeat credit for students who completed 294 section 2 in fall 2010 or section 1 in fall 2009. [3] (INT)

**HIST 2570. Caribbean History, 1492-1983.** [Formerly HIST 257] Amerindian society; age of encounter; imperial contest; slavery and abolition. U.S. influence; independence movements; cultural movements; invasion of Grenada. [3] (INT)

**HIST 2580. American Indian History before 1850.** [Formerly HIST 258] Indian nations' interaction with each other and with European colonies. Resistance and adaptation to colonialism. Early development of United States Indian policy. [3] (US)

**HIST 2590. American Indian History since 1850.** [Formerly HIST 259] American Indians in the United States and Canada. Their responses to government policies and other forces. Cultural, socioeconomic, and political change among Indian communities. [3] (US)

**HIST 2595W. Pirates, Plantations, and Power: The English Atlantic World, 1500-1688.** [Formerly HIST 243W] Elizabethan era to Glorious Revolution. Shift from piracy to colonization of Ireland and the Americas. Cross-cultural contact, race formation, economies of empire, and migration. [3] (US)

**HIST 2600. North American Colonial History.** [Formerly HIST 260] European colonization before 1763. Development of North American colonies from the origins of Spanish colonization to the conclusion of the Seven Years' War. Contests among European empires, their interaction with Native American societies, and their enslavement of African peoples. [3] (US)

**HIST 2610. The Founding Generation.** [Formerly HIST 261] American history from the 1760s to the 1820s. The Revolutionary War, the Constitution, formation of national government. Political conflict, national culture, commerce, diplomacy, and race and gender in an age of revolution. Primarily for Juniors and Seniors. [3] (US)

**HIST 2620. The Old South.** [Formerly HIST 262] The South's origins in European expansion; the rise of the plantation economy and society, and its identification with slavery; the differing experiences of whites and blacks, planters and nonplanters; the relationship of the region to the larger United States; the Confederate attempt at independence and the collapse of the slave regime. [3] (US)

**HIST 2630. The New South.** [Formerly HIST 263] The aftermath of war and emancipation and the era of Reconstruction; social change and dislocation in the late nineteenth century; the Populist Revolt; the origins of segregation and one-party politics. Twentieth-century efforts to modernize the region; the economic, political, and Civil Rights revolutions of the mid-twentieth century; the South in modern American society and politics. [3] (US)

**HIST 2640. Appalachia.** [Formerly HIST 264] The region from first European intrusions to the present. Frontier-era white-indigenous contact, antebellum society and economy, relations with the slave South, the Civil War and postwar politics, increasing social strainings, industrialization and labor conflict, poverty and outmigration. Examination of mountain culture, tourism, and the construction of the "hillbilly" image. [3] (US)

**HIST 2650. The U.S. in the Era of the Civil War.** [Formerly HIST 265] Sectional conflict, secession, the Southern War for Independence, and Reconstruction; 1850-1877. [3] (US)

**HIST 2655. Historic Black Nashville.** From settlement through the Civil War. Secondary literature and archival research to identify significant black history sites in Nashville. No credit for students who have earned credit for UNIV 2655. Offered on a graded basis only. [3] (US)

**HIST 2660. The Birth of Modern Capitalism and Human Trafficking.** [Formerly HIST 266] Closure of the Atlantic slave trade in eighteenth and

nineteenth-century Britain and the United States. State formation, the birth of modern human rights discourse, and ideas about compassionate capitalism. [3] (INT)

**HIST 2685. Race and U.S. Visual Culture.** From the 1700s to the present. Iconic texts, major themes, and transformative figures in the representational history of African Americans. Art and photography as strategies for racial uplift. Intra-racial satire. Black entertainment culture and societal imagery. Issues of gender, class, and sexuality. No credit for students who have earned credit for 294-01 offered spring 2014 or 294-01 offered spring 2012. [3] (P)

**HIST 2690. The Civil Rights Movement.** [Formerly HIST 269] Following two decades of progress from *Brown v. Board of Education* in 1954 toward racial justice and equality in the United States. Leaders, organizations, and milestones. [3] (US)

**HIST 2700. The U.S. and the World.** [Formerly HIST 270] From the winning of independence to the Great Depression. Relationships among foreign policy, ideology, domestic politics, and social and economic change. [3] (US)

**HIST 2710. The U.S. as a World Power.** [Formerly HIST 271] From the origins of World War II, through the Cold War, to the present day. Relationships among foreign policy ideology, domestic politics, and social economic change. [3] (US)

**HIST 2720. World War II.** [Formerly HIST 172] Origins and causes of the global conflict; the six years of military campaigns; politics and diplomacy of war-making; race as a factor shaping the war in Europe and Asia. Impact of technological innovations; social and economic aspects of the struggle, as well as its moral and psychological implications. [3] (INT)

**HIST 2721. Globalizing American History, 1870-1940.** [Formerly HIST 272A] Immigration; diasporic social movements; transnational social reform campaigns; military, colonial, and corporate empire-building; expansion of missionary activity; United States' participation in World War I. [3] (US)

**HIST 2722. Globalizing American History, 1940-2010.** [Formerly HIST 272B] The rise of U.S. world power after 1940 and the transformation of American society through its global interactions. Impact of transnational mobility and communications, connected social movements, war and militarization, and mass immigration. [3] (US)

**HIST 2725. Race, Power, and Modernity.** [Formerly HIST 272C] Historical approaches to race as a modern system of power and difference. The United States experience in comparative and transnational perspective. Race as an historical and socially-constructed ideological system. Race intersecting with nationality, region, class and gender. Race in the making of space, citizenship, and economic institutions. [3] (US)

**HIST 2730. American Masculinities.** [Formerly HIST 272D] Changing definitions of manhood and masculinity from the colonial period to the post-9/11 era. The rise of democratic politics, industrialization, slavery and emancipation, feminist politics, and the growth of the global power of the United States. [3] (US)

**HIST 2735. Debating America in the World, 1890-2010.** [Formerly HIST 272E] Debates about the U.S. role in shaping the twentieth century. War; colonialism and anti-colonialism; immigration; participation in international institutions. [3] (US)

**HIST 2740. Immigration, the United States, and the World.** Mid-nineteenth century to present. Relationship between U.S. immigration policy and politics; international relations. Impacts of war, diplomacy, and international pressure on U.S. immigration policy. [3] (US)

**HIST 2750. American Intellectual History since 1865.** [Formerly HIST 275A] Modern U.S. social thought. Debates over progress, science, nationalism, race, and economy. Ideas in their cultural context. Popular as well as elite thinkers. [3] (HCA)

**HIST 2780. Superhuman Civilization.** [Formerly HIST 153] Trends in human biological enhancement through the re-engineering of basic physical and mental traits. Debates over transhumanism, designer babies, neuro-

ethics, and technological determinism. Long-term implications for social justice and human identity. [3] (P)

**HIST 2800. Modern Medicine.** [Formerly HIST 280] Scientific, social, and cultural factors influencing the rise of modern medicine. Europe and the U.S., 1750 to the present. [3] (P)

**HIST 2810. Women, Health, and Sexuality.** [Formerly HIST 281] Women as patients and healers in the U.S. from 1750 to the present. Topics include women's diseases and treatments; medical constructions of gender, sexuality; childbirth, birth control, abortion; midwives, nurses, and doctors. [3] (US)

**HIST 2835. Sexuality and Gender in the Western Tradition to 1700.** [Formerly HIST 183] Politics, war, and masculinity; Christianity and sexuality; changing ideas about gender roles and sexual practices. [3] (P)

**HIST 2840. Sexuality and Gender in the Western Tradition since 1700.** [Formerly HIST 184] Modern masculinity, femininity, and gender roles; origins of identity politics and changing sexual norms; contemporary feminist issues. [3] (P)

**HIST 2855. Women and Gender in the U.S. to 1865.** [Formerly HIST 185] Social and cultural history of gender, race, and sexuality as represented in literary, legal and artistic texts. Exploration of Native American conquest, captivity narratives, abolitionism and sentimental fiction, nationalism and gender ideas. [3] (US)

**HIST 2860. Women and Gender in the U.S. since 1865.** [Formerly HIST 186] Social and cultural history of the intertwined ideas and practices of gender, race, and sexuality. Exploration of experiences, representations, and activism in feminist and gay rights movements, interracial unions, marriage and the family, black women's activism, suffrage, and sexual revolutions. [3] (US)

**HIST 3000W. The History Workshop.** [Formerly HIST 200W] Introduction to the "historian's craft." Reconstructing the past using primary documents, diaries, letters, memoirs, and declassified government papers. Methods of historical research and reasoning through individual projects. Open only to history majors. [3] (SBS)

**HIST 3010. Pornography and Prostitution in History.** [Formerly HIST 187] Commercialization of the sex trade, Renaissance to the present. Political scandal, capitalism, and globalization; effects of technological change, from the printing press to the Internet. Readings from anthropology, psychology, and feminist theory. [3] (P)

**HIST 3040. Health and the African American Experience.** [Formerly HIST 284B] Disparities in the health care of African Americans, the training of black professionals, and the role of black medical institutions. The intersection between black civic involvement and health care delivery; the disproportionate impact of disease and epidemics within the African American population. [3] (US)

**HIST 3045W. Eugenics in the U.S., 1865-present.** [Formerly HIST 284D] Comparative perspective. Compulsory sterilization, restrictive immigration acts, "fitter family" contests, medical genetics, and eugenic counseling. Ideas and practices shaped by attitudes toward race, gender, class, and disability. No credit for students who earned credit for HONS 182 section 26 in fall 2012. [3] (US)

**HIST 3050. Innovation.** [Formerly HIST 285C] Origin, reception, and cultural impact of technological innovation. New technologies from the mid-nineteenth century through present-day Silicon Valley and their technical, social, economic, and political dimensions. [3] (P)

**HIST 3070W. Science, Technology, and Modernity.** [Formerly HIST 285W] Social, cultural, intellectual, and artistic responses to the challenges posed by modern science and technology from the mid-nineteenth to the mid-twentieth centuries. Offered on a graded basis only. [3] (P)

**HIST 3090. Tokyo: History and Image.** [Formerly HIST 286C] Tokyo and its representation in various media from the mid-nineteenth century to the present and imaginings of the future. The city's physical development and image in photographs, films, novels, essays, and other textual and visual materials produced within Japan and beyond. [3] (INT)

**HIST 3100. Pirates of the Caribbean.** [Formerly HIST 286D] Imperial competition for control of the Caribbean and state-sponsored piracy. The economic and political consequences of piracy in the Caribbean. The life of pirates aboard ship and in port. [3] (INT)

**HIST 3110. Christianity in China.** [Formerly HIST 286E] Encounters between Western missionaries and Chinese society. Growth of an indigenous church. Translation of the Bible into Chinese. Debates about papal authority. Anti-Christian movements. Relationship between Christianity and Communism in China today. [3] (INT)

**HIST 3120. Weimar Germany: Modernism and Modernity, 1918-1933.** [Formerly HIST 286G] Culture and politics. Mass politics, mass media, economic crisis, and social tensions. Architecture, film, theater, painting, and philosophy. [3] (HCA)

**HIST 3130. History, Trauma, and Memory.** [Formerly HIST 287A] Relationships between personal experiences and history. Historical writing, literature, and film from the 20th and 21st centuries. [3] (HCA)

**HIST 3140. History of New Orleans.** [Formerly HIST 287B] The city since its founding. Interactions between urban society and natural environment; historical and cultural significance of New Orleans in light of post-Katrina disaster and reconstruction. [3] (US)

**HIST 3150. Cities of Europe and the Middle East.** [Formerly HIST 287C] Cities of "East" and "West" in the modern period; distinguishing characteristics and shared patterns of urban modernity across different geographies. Conceptions of the European, Middle Eastern, and Islamic metropolis. [3] (INT)

**HIST 3170. The Federalist Papers.** [Formerly HIST 287E] Classic works on American constitutionalism and government and their views on human nature and republicanism. The framers' rejection of democracy and fear of legislative abuses. The Constitution's emphasis on institutional protections for liberty and checking abuses of power. [3] (US)

**HIST 3180. Making of Modern Paris.** [Formerly HIST 287G] The social and cultural history of Paris from the old regime to the present. Paris versus the French provinces; revolutionary upheavals; challenges of rapid urbanization. Paris as a literary, artistic, and consumer capital; its changing physical landscape. Immigration and the globalization of Paris. [3] (INT)

**HIST 3190. Religion, Culture, and Commerce: The World Economy in Historical Perspective.** [Formerly HIST 288A] Cross-cultural trade in a broad chronological and geographical framework. Pre-modern and modern times, western and non-western locales. The role of religion in economic exchange and the movement of commodities. Offered on a graded basis only. [3] (HCA)

**HIST 3200. Poverty, Economy, and Society in Sub-Saharan Africa.** [Formerly HIST 288B] History of poverty from pre-colonial times to the present. The evolution of economic systems and trading; impacts of trans-oceanic slave, commodity trading, and colonialism on Africans' standards of living; contemporary African economic challenges of underdevelopment, debt, foreign aid, fair trade, and globalization. No credit for students who earned credit for 295 section 3 in spring 2007 or 294 section 1 in fall 2008. [3] (INT)

**HIST 3210. Muslims, Christians, and Jews in Medieval Spain.** [Formerly HIST 288C] Coexistence and conflict from 711 to 1492. The blend of cultures, languages, religions, and societies under both Christian and Islamic rule. Offered on a graded basis only. No credit for students who have earned credit for JS 1111 section 1. [3] (INT)

**HIST 3220W. Images of India.** [Formerly HIST 288D] Images in and of South Asia as studied through maps, religious imagery, print culture, cinema, and architecture. The politics of visual stereotypes of India. The visual history of Orientalism, modernity, gender, and religion in South Asia. [3] (INT)

**HIST 3230. The Art of Empire.** [Formerly HIST 288E] Visual media in the establishment of modern empires, with emphasis on Western Europe. Image-making and power; art in cultural exchange and the definition of race, ethnicity, and gender. [3] (HCA)

**HIST 3240W. Culture of the Sixties in Europe and the U.S.** [Formerly HIST 288G] Youth, rock 'n roll, sexual attitudes, black power, counterculture, and conservative reaction. Cultural revolution or myth. [3] (INT)

**HIST 3260. Revolutionary England, 1603-1710.** [Formerly HIST 289A] Causes, nature, and consequences of the English Revolution and the Glorious Revolution. Religious struggle, the fiscal-military state; political thought; parliament and party politics. The Stuart dynasty; the English Republic; court culture and civil war. [3] (HCA)

**HIST 3270. Religion and the Occult in Early Modern Europe.** [Formerly HIST 289D] Popular and learned ideas about religion and the supernatural within the context of the religious reforms of the sixteenth century. Alchemical and astrological practices to ghosts, werewolves, fairies, and other supernatural beings. The witch craze phenomenon of 1560-1650. Offered on a graded basis only. No credit for students who earned credit for 295 section 1 in fall 2011. [3] (HCA)

**HIST 3275. Religion and Popular Culture in Nineteenth-Century Europe.** [Formerly HIST 289E] Popular religious beliefs and practices in their social, cultural, political, and gender contexts. Concentration on Britain, France, and Germany. Offered on a graded basis only. [3] (SBS)

**HIST 3280. Popular Cultures in Modern Latin America.** [Formerly HIST 290A] 1800 to the present. Music, theater, literature, art, dance, and religion. Cultural performance among popular groups and their attempts to construct, control, and commercialize expression. [3] (INT)

**HIST 3746. Workshop in English and History.** [Formerly HIST 291] (Also listed as English 3746) Team-taught by a historian and an interdisciplinary scholar. Explores intersection of disciplines through close examination of texts in historical context. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Preference to students majoring in the English-History program. [3] (No AXLE credit)

**HIST 3850. Independent Study.** [Formerly HIST 296] A program of reading in one field of history to be selected in consultation with an adviser. Normally limited to qualified majors in history. Approval of faculty adviser and director of undergraduate studies required. May be repeated for credit once if there is no duplication in topic and not twice from the same instructor, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits for all semesters of HIST 3850] (No AXLE credit)

**HIST 3880. Internship Training.** [Formerly HIST 293A] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs. In some cases, such as historical societies or museums, history is a central part of the organization's missions; in other cases, the student will play a role in managing the institution's records or writing its history. Two options are available. (1) full-time: 12-15 hours total, including 6-9 hours in 3880, 3 hours in 3881, and 3 hours in 3882. (2) Part-time: 6-9 hours total, including 3-6 hours in 3880 and 3 hours in either 3881 or 3882. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in history; they must submit a specific plan for the internship to the director of undergraduate studies. After completing the internship, all students must write a thorough report. Must be taken Pass/Fail and concurrently with 3881 and/or 3882. These hours may not be included in the minimum hours required for the history major. Corequisite: 3881 and/or 3882. [3-9] (No AXLE credit)

**HIST 3882. Internship Readings.** [Formerly HIST 293C] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs. In some cases, such as historical societies or museums, history is a central part of the organization's missions; in other cases, the student will play a role in managing the institution's records or writing its history. Two options are available. (1) full-time: 12-15 hours total, including 6-9 hours in 3880, 3 hours in 3881, and 3 hours in 3882. (2) Part-time: 6-9 hours total, including 3-6 hours in 3880 and 3 hours in either 3881 or 3882. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in history; they must submit a specific plan for the internship to the director of undergraduate studies. After completing

the internship, all students must write a thorough report. Readings and a substantial interpretive essay on topics related to the internship training, under the supervision of a member of the Vanderbilt Department of History. Corequisite: 3880. [3] (No AXLE credit)

**HIST 3883. Internship Research.** [Formerly HIST 293B] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs. In some cases, such as historical societies or museums, history is a central part of the organization's missions; in other cases, the student will play a role in managing the institution's records or writing its history. Two options are available. (1) full-time: 12-15 hours total, including 6-9 hours in 3880, 3 hours in 3882, and 3 hours in 3883. (2) Part-time: 6-9 hours total, including 3-6 hours in 3880 and 3 hours in either 3882 or 3883. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in history; they must submit a specific plan for the internship to the director of undergraduate studies. After completing the internship, all students must write a thorough report. Students will write a substantial research paper under the supervision of a member of the Vanderbilt Department of History. Corequisite: 3880. [3] (No AXLE credit)

**HIST 3890. Selected Topics in History.** [Formerly HIST 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**HIST 3980. Junior Honors Seminar in History.** [Formerly HIST 297] The first semester of a three-semester sequence of honors study leading to the writing of an honors thesis in history. Introduction to historical thinking, research, and writing. Readings from the major fields of historical scholarship, representing the United States, Europe, Latin America, and Asia. Open to juniors beginning honors work in history, or to qualified history majors with the approval of the director of undergraduate studies. [3] (No AXLE credit)

**HIST 4960. Majors Seminar.** [Formerly HIST 295] Advanced reading, research, and writing. Topics vary. Offered on a graded basis only. Limited to juniors and seniors and intended primarily for history majors. Prerequisite: 3000W. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 6 credits total for all semesters of HIST 4960] (No AXLE credit)

**HIST 4980. Senior Honors Research Seminar.** [Formerly HIST 298A] Presentation and discussion of drafts and chapters of honors theses in progress. Offered on a graded basis only. Open only to senior departmental honors students. [3] (No AXLE credit)

**HIST 4981. Senior Honors Research Seminar.** [Formerly HIST 298B] Continuation of 4980. Offered on a graded basis only. Open only to seniors in the departmental honors program. Prerequisite: 4980. Corequisite: 4999. [3] (No AXLE credit)

**HIST 4999. Senior Honors Thesis.** [Formerly HIST 299] Writing an honors thesis under the supervision of a thesis adviser and the Director of Honors. Open only to seniors in the departmental honors program. Offered on a graded basis only. Prerequisite: 4980. Corequisite 4981. [3] (No AXLE credit)

## History of Art

**HART 1001. Commons Seminar.** [Formerly HART 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**HART 1100. History of Western Art I.** [Formerly HART 110] Visual and material culture of Europe and the Ancient Near East from the Paleolithic through the late Medieval period. Egypt, Greece, and Rome; early Christianity and Islam. Form, content, and meaning of works of art and architecture in their cultural context. [3] (HCA)

**HART 1105. History of Western Art II.** [Formerly HART 111] Major artistic movements from the Renaissance to the Modern era and the developments in painting, sculpture, and architecture. Works of specific artists

and cultural factors that affect the visual arts from production to reception. [3] (HCA)

**HART 1111. First-Year Writing Seminar.** [Formerly HART 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**HART 1120. History of Western Architecture.** [Formerly HART 112] Architecture in Europe, Western Asia, and North America from the early first millennium BCE to the present. Form and function; historical, social, and spatial contexts; architects and patrons. No credit for students who have earned credit for 112a. [3] (HCA)

**HART 1121. History of Western Architecture I.** [Formerly 112A] From prehistoric Europe and Western Asia to Renaissance Italy and the Ottoman Golden Age. Form and function; historical, social, spatial contexts; architects and patrons. No credit for students who have earned credit for 1120. [3] (HCA)

**HART 1200. Arts of East Asia.** [Formerly HART 120] A survey of sculpture, painting, and architecture in China, Japan, and Korea. Historical, religious, philosophical, and cultural background. [3] (INT)

**HART 1205. Arts of South and Southeast Asia.** [Formerly HART 125] Second millennium BCE to present. Formation of political and social identities as reflected in artistic productions. Development of artistic traditions in response to cultural exchange and political dynamics. [3] (INT)

**HART 1220. History of Asian Architecture.** [Formerly HART 122] Cultural traditions of Asia from the first millennium BCE to the nineteenth century through the study of architecture. Cities, temples, and domestic structures of China, Japan, Korea, South Asia (India and Pakistan), and Southeast Asia. [3] (INT)

**HART 1285W. Introduction to Medieval Art.** From the third to fifteenth century; Late Antique period to Late Gothic period. Architecture, sculpture, painting, and the minor arts of Western Europe in historical context, including Byzantine and Islamic art. No credit for students who have earned credit for 2270 or 2285. [3] (INT)

**HART 1300. Monuments and Masterpieces.** [Formerly HART 130] The social and cultural history of the world in fourteen great works, including the Athenian Parthenon, the Pantheon in Rome, the Konjiki-do in Japan, Michelangelo's Sistine Chapel, and the U.S. Capitol. Sculpture, painting, architecture, and the decorative arts. [3] (INT)

**HART 1400. U.S. Icons and Monuments.** [Formerly HART 140] From 1776 to present. How and why images of people, historical events, and symbols are revered. Implications for national identity, historical memory, consumerism, and political ideologies. The U.S. Capitol, Statue of Liberty, Mount Rushmore, Marilyn Monroe, and Michael Jordan. No credit for students who have earned credit for 1111 section 13. [3] (US)

**HART 1500W. Impressionism.** Painting style developed by Monet, Renoir, Pissarro, Cassatt, Morisot, and others, with emphasis on changing atmospheric effects. Work of the French Impressionists from formal, social, political, and intellectual perspectives. Impact of French Impressionism across Europe and North America. [3] (HCA)

**HART 1750W. African American Arts.** Blackness and black culture as subject and context for African American visual arts from the 20th and 21st centuries. Emphasis on arts derived from African American cultural perspectives. No credit for students who have earned credit for 2750. [3] (P)

**HART 2110. Arts of China.** [Formerly HART 252] Artistic production from the Neolithic period through the Qing dynasty in relation to religious and cultural contexts. [3] (HCA)

**HART 2130. Arts of Japan.** [Formerly HART 253] Artistic production from the Neolithic through Meiji periods in relation to religious and cultural contexts. [3] (HCA)

**HART 2150. East Asian Architecture and Gardens.** [Formerly HART 251] East Asian religious, vernacular, and garden architecture from the second century CE to the present. Influence of Buddhism on East Asian architecture, fengshui, and site selection, garden as religious landscape, Asia in modern architecture. [3] (HCA)

**HART 2170. Religion and politics in South and Southeast Asian Art.** [Formerly HART 246] Use of Buddhist, Hindu, and Jain images as political communication in South and Southeast Asia from the time of Buddha (480-400 BC) to the present. The original patronage of temples and religious icons, and their reappropriation in ancient and modern times. [3] (INT)

**HART 2175. Modern and Contemporary Indian Architecture.** From nineteenth-century British colonial rule to the present. Built environment of Indian subcontinent in local and global contexts. Eighteenth-century Jaipur and urban planning, the British Raj, Calcutta, Allahabad, and Edwin Lutyens' New Delhi. Le Corbusier, Louis Kahn, the Neo-Gothic of Bombay, and contemporary architecture. [3] (INT)

**HART 2180. Islamic Art and Architecture.** [Formerly HART 244] Visual and building traditions from the seventh through twentieth centuries. Cultural, sacred, political, and historical forces shaping art from Islamic Spain and Turkey to Iran and India. Dome of the Rock, the Alhambra, the Suleymaniye mosque, Persian illustrated manuscripts, and the Taj Mahal. [3] (INT)

**HART 2192. Modern and Contemporary African Art.** 1940 to present. Painting, sculpture, photography, performance and film examined in relationship to political, cultural, historical, and aesthetic contexts on and off the African continent. Tradition, colonialism and post-colonialism, diaspora, nationalism, and gender. Issues regarding collecting, exhibiting, and selling contemporary African art. [3] (INT)

**HART 2210. Art and Architecture of Ancient Egypt.** [Formerly HART 268] Art, architecture, and culture of Egypt from the fourth millennium through the Old, Middle, and New Kingdoms. Sculpture, wall painting, architecture, and material culture. Serves as repeat credit for students who have completed CLAS 217. [3] (HCA)

**HART 2220. Greek Art and Architecture.** [Formerly HART 255] The Bronze Age, including the Minoans and Mycenaeans, through the Hellenistic period. The social and cultural contexts of material and visual culture. Vase-painting, sculpture, architecture, and more utilitarian artifacts. No credit for students who have earned credit for 2222, 257, 258, or CLAS 2200 or 2210. [3] (HCA)

**HART 2260. The Art of Pagans, Christians, and Jews.** [Formerly HART 207] Religious art of the Roman Empire in late antiquity. Visual art reflecting religious beliefs and practices. Greco-Roman cults, early Christianity, and Rabbinical Judaism. [3] (HCA)

**HART 2270. Early Christian and Byzantine Art.** [Formerly HART 210] The development of architecture, sculpture, painting, and the minor arts from the third through eleventh centuries. [3] (HCA)

**HART 2275. The Cross and the Crescent: Byzantine-Islamic Confluences in Art.** Developments at the interface of Byzantium and early Muslim empires, ca. 500-1000 C.E. Cross-cultural processes shaping visual sensibilities. Doctrinal issues and aniconism mirrored in architecture, ornament, mosaics, illuminated manuscripts, coinage. Exemplary sites: San Vitale in Ravenna, Hagia Sophia in Istanbul, Dome of the Rock in Jerusalem, and the Umayyad mosque in Damascus. [3] (INT)

**HART 2285. Medieval Art.** [Formerly HART 211] The development of architecture, sculpture, painting, and the minor arts in Europe from the eleventh through the fifteenth centuries. [3] (HCA)

**HART 2288. Art of the Book.** Material and visual composition of medieval manuscripts; working with medieval and contemporary artists' books in Vanderbilt's Special Collections. Audience, changing popularity of texts and illustrations, and concerns of patrons and artists. Exemplary works include the "Book of Kells," "Luttrell Psalter," and "Tres Riches Heures." Offered on a graded basis only. [3] (HCA)

**HART 2290. Gothic Paris.** From the twelfth to the fifteenth century. Architecture, sculpture, painting, and the luxury arts. No credit for students who have earned credit for 2285. [3] (INT)

**HART 2310. Italian Art to 1500.** [Formerly HART 218] Early development of art and architecture primarily in central Italy from the late thirteenth through the fifteenth centuries. The works of Giotto, Duccio, Donatello, Masaccio, and Botticelli. The age of the Medici in Florence. No credit for students who have earned credit for 3320 or 3320W. [3] (HCA)

**HART 2320W. The Italian Renaissance Workshop.** Development of artists' shops, 14th into 16th century. Organization and production. Painting and sculpture techniques. Role of artists in society. Fra'Angelico, Andrea del Verrocchio and the young Leonardo da Vinci, and Sandro Botticelli. Firsthand study of works in the Kress Collection at Vanderbilt. Offered on a graded basis only. No credit for students who have earned credit for 3320W. [3] (HCA)

**HART 2325. Great Masters of the Italian Renaissance.** From the late Gothic to the High Renaissance. Landmarks in painting, sculpture, and architecture in central Italy. Trecento Sieneese masters; Giotto, Donatello, Botticelli, and Leonardo in Florence; and Michelangelo and Raffaello in Rome. Tempera and fresco technique; civic, ecclesiastic, and domestic buildings; and stylistic progression. No credit for students who have earned credit for 2310. [3] (INT)

**HART 2330. Italian Renaissance Art after 1500.** [Formerly HART 219] High Renaissance and Mannerist art in sixteenth-century Italy, considering Florentine masters such as Leonardo, Michelangelo, and Pontormo, the Roman school of Raphael, and the Venetians from Giorgione and Titian to Tintoretto. [3] (HCA)

**HART 2362. Fifteenth-Century Northern European Art.** [Formerly HART 214] Painting, sculpture, prints, and court art in the Low Countries, France, and Germany. Historical, social, economic, religious, and technical analysis. Jan van Eyck, Rogier van der Weyden, and Hieronymus Bosch. No credit for students who have earned credit for 2360. [3] (HCA)

**HART 2390. Seventeenth-Century Art.** [Formerly HART 221] European painting, sculpture, architecture, and graphic arts. Caravaggio, Bernini, Velazquez, Rubens, and Rembrandt. [3] (HCA)

**HART 2600. Eighteenth-Century Art.** [Formerly HART 224] The history of European painting, sculpture, and printmaking from the Late Baroque era to the rise of Neoclassicism (1675-1775). Geographical focus on Italy and France. Artists include Maratti, Rusconi, Carriera, Tiepolo, Watteau, Chardin, Fragonard, and others. [3] (HCA)

**HART 2620. Nineteenth-Century European Art.** [Formerly HART 230] French Revolution to the early twentieth century. International context for artistic movements. The rise of abstraction and the relationship between art, politics, and social change. [3] (INT)

**HART 2622. Neoclassicism and Romanticism.** [Formerly HART 226] A survey of major artists and monuments of visual culture considered in their political, social, economic, spiritual, and aesthetic contexts from 1760 to 1840. [3] (HCA)

**HART 2625. French Art in the Age of Impressionism.** French painting, sculpture, and drawing in its social, political, aesthetic, academic, and spiritual context from 1848 to 1886. The Social Realism of Daumier and Courbet; Manet and Aesthetic Realism; Monet, Renoir, Pissarro, Degas, Morisot, and Impressionism; and the rise of Neo- and Post-Impressionism with Seurat and van Gogh. No credit for students who have earned credit for 1500W or 4960-01 offered fall 2015. [3] (INT)

**HART 2650. Nineteenth-Century Architecture: Theory and Practice.** [Formerly HART 229] European and North American architecture from the French Revolution to the First World War. The relationships among architecture and technology, political regimes, social formations, and conceptions of history. Neoclassicism, Gothic Revival, Second Empire, the Arts-and-Crafts Movement, and Commercial Architecture. [3] (HCA)

**HART 266. Cities of the Roman East.** Provincial centers, sanctuaries, and monuments from Greece to Arabia. Major centers and case studies of public and private commissions. Architectural reflections of Romanization and resistance; local and imperial patronage; patrimony and memory; borderland architecture. [3] (HCA)

**HART 2660. American Art to 1865.** [Formerly HART 240] Painting and sculpture of the United States from Colonial times to 1865 with an emphasis on iconography, social history, race, and gender. [3] (US)

**HART 2665. The Vanderbilts as Patrons: Taste-Makers of Gilded-Age Art and Architecture.** The Vanderbilts' roles as patrons and taste-makers in translation of European architectural and artistic styles to the United States. Famed Vanderbilt estates such as Biltmore in Asheville, NC and the Breakers in Newport, RI. No credit for students who have earned credit for 288 01 offered spring 2015. [3] (HCA)

**HART 268. Art and Architecture of Ancient Egypt.** Art, architecture, and culture of Egypt from the fourth millennium through the Old, Middle, and New Kingdoms. Sculpture, wall painting, architecture, and material culture. Serves as repeat credit for students who have completed CLAS 217. [3] (HCA)

**HART 2680. British Art: Tudor to Victorian.** [Formerly HART 222] Art and visual culture in the British Isles from the reign of Henry VIII in the sixteenth century to Queen Victoria and the rise of the pre-Raphaelites in the nineteenth century. Portraiture and landscape painting, relationship between art and empire, rise of the Royal Academy, and patterns of patronage. Holbein, Hogarth, Gainsborough, Reynolds, Lawrence, and Turner. [3] (HCA)

**HART 2708. Twentieth-Century British Art.** [Formerly HART 223] Painting, sculpture, installation, film and video, and performance in the context of national culture and political history. [3] (HCA)

**HART 2710. Twentieth-Century European Art.** [Formerly HART 231] Painting, sculpture, and architecture; stressing a social-historical approach to the study of style. [3] (HCA)

**HART 2720. Modern Architecture.** [Formerly HART 232] A survey of nineteenth-century styles from Federal to Victorian, and major twentieth-century architects and designers from Wright and the Bauhaus to Eames and Kahn. City planning and preservation. [3] (HCA)

**HART 2722. Modern Art and Architecture in Paris.** [Formerly HART 235] Painting, sculpture, photography, and architecture. Maymester course; first two weeks at Vanderbilt, last two weeks in Paris. [3] (HCA)

**HART 2750. African American Art.** [Formerly HART 239] Colonial Era to the present. Artwork and artists in their political, cultural, social, historical, and aesthetic contexts. Relationship between race and representation. [3] (P)

**HART 2760. Early American Modernism, 1865-1945.** [Formerly HART 241] Painting and sculpture of the United States between the Civil War and the Second World War with emphasis on iconography, social history, class, and gender. [3] (US)

**HART 2765. Art since 1945.** [Formerly HART 242] A survey of art produced in the United States and Europe since 1945 with an emphasis upon theory and the social and intellectual factors. [3] (US)

**HART 2780. History of Western Urbanism.** [Formerly HART 270] Urban form and planning from antiquity to the present. The integration of architecture and landscape. Diachronic surveys. Case studies, including Nashville. [3] (P)

**HART 2782. Storied Places: History of Landscape Design.** [Formerly HART 271] Landscape architecture as art form in Europe, Western Asia, and North America, from antiquity to the present. Stewardship and manipulation of land and water. Design of gardens and green spaces. Social and political meanings and messages. [3] (HCA)

**HART 3112. The Arts of China during the Liao-Song Period.** [Formerly HART 249] Art and architecture of China during the Liao-Song period from C.E. 907 to C.E. 1279. Political, religious, and aesthetic contexts. Influence of coastal trade and pilgrimage in transformations of painting, sculpture, ceramics, and architecture. [3] (INT)

**HART 3140. Healing and Art in East Asia.** Influence of early healing practices on the development of the arts of East Asia. Magical healing texts, talismans, and tattoos; diagramming the body and the landscape; and the art of the Buddha of Medicine. Gardens and growing transfor-

mative herbs. Tea as medicine and art. No credit for students who have earned credit for HONS 1820W-28. [3] (HCA)

**HART 3164W. Art of Buddhist Relic and Reliquary.** [Formerly HART 245W] From second century BCE to present. Relic veneration and construction of reliquaries from a visual perspective. Beautification, ritualization, use and abuse, and bodily issues spanning India, China, Korea, Japan, and Southeast Asia. [3] (INT)

**HART 3172. Himalayan Art: Art of the Divine Abode.** [Formerly HART 247] Art of Nepal and Tibet from its inception to the present. Religious and cultural contexts. Initial western responses; Hindu and Buddhist art and architecture in Nepal; Tibetan Buddhist Art; artistic productions in the Tibetan diaspora; and souvenir art in Nepal. [3] (INT)

**HART 3174. The South Asian Temple.** [Formerly HART 248] From its inception to the present. Morphological and stylistic analysis. Anthropological and ethnographical approach to temples as living communal entities. [3] (INT)

**HART 3224. Greek Sculpture.** [Formerly HART 264] Style, materials, and techniques ca. 900-31 B.C. Sculptors' craft and their reasons for the creation of both free-standing and architectural sculpture. Serves as repeat credit for students who have completed CLAS 216. [3] (HCA)

**HART 3226. Greek Vases and Society.** [Formerly HART 265] Ancient Greek vases as social documents. Interdisciplinary approaches, including historiographic, stylistic, semiotic, contextual, and scientific. Production, trade, and the functions of vases in funerary and ritual contexts, particularly the symposium. The development of black- and red-figure vase painting and iconography. [3] (HCA)

**HART 3228W. Gender and Sexuality in Greek Art.** [Formerly HART 262W] Iconography of vase-painting and sculpture, from the Archaic through the Hellenistic periods. Visual constructions of bodies, poses, gestures, and dress, reflecting cultural attitudes towards courtship, marriage, rape, prostitution, and homosexuality. Emphasis on methodological approaches and comparisons with modern societies. Offered on a graded basis only. [3] (HCA)

**HART 3240W. Ancient Landscapes.** [Formerly HART 260W] Greco-Roman attitudes toward nature. Exploitation and stewardship of resources. Country-house and garden design. Representations of mythological and sacred landscapes in painting and poetry. [3] (HCA)

**HART 3252. Cities of the Roman East.** [Formerly HART 266] Provincial centers, sanctuaries, and monuments from Greece to Arabia. Major centers and case studies of public and private commissions. Architectural reflections of Romanization and resistance; local and imperial patronage; patrimony and memory; borderland architecture. [3] (HCA)

**HART 3272. Portraits in Late Antiquity.** [Formerly HART 206] Social, political, and religious functions of portraits from the first century through the sixth century CE. Issues of representation, including the construction of identity, social status, mediation of presence through image, and what constitutes a likeness. Portraits as memorials, as objects of veneration, and idealized models. Influences on later portraiture. [3] (HCA)

**HART 3274. Art and Empire from Constantine to Justinian.** [Formerly HART 208] An interdisciplinary study of Roman social, political, religious, and art historical developments in the fourth through sixth centuries CE. [3] (HCA)

**HART 3320. Early Renaissance Florence.** [Formerly HART 217] Painting and sculpture in fifteenth-century Florence. Ghiberti, Donatello, Masaccio, Fra Angelico, and Botticelli. Stylistic progression; iconographic interpretation and meaning; the role of patronage and audience; and original physical and cultural context. The Italian Renaissance workshop. No credit for students who have earned credit for 2310. Repeat credit for students who have earned credit for 3320W. [3] (HCA)

**HART 3320W. Early Renaissance Florence.** [Formerly HART 217W] Painting and sculpture in fifteenth-century Florence. Ghiberti, Donatello, Masaccio, Fra Angelico, and Botticelli. Stylistic progression, iconographic interpretation and meaning, the role of patronage and audience, original physical and cultural context, and the Italian Renaissance workshop. Offered on a

graded basis only. No credit for students who have earned credit for 2310. Repeat credit for students who have completed 3320. [3] (HCA)

**HART 3332. Raphael and the Renaissance.** [Formerly HART 216] Art in Central Italy, ca. 1400-1520, with a focus on Raffaello Sanzio. His origin and artistic formation in Urbino and Perugia, early commissions in Florence, mature works and legacy in Rome. Predecessors Masaccio, Donatello, Piero della Francesca, and Pietro Perugino. Contemporaries Leonardo and Michelangelo. Taught on location in Italy. [3] (INT)

**HART 3334. Michelangelo's Life and Works.** [Formerly HART 220] Sculpture, painting, architecture, and graphic works. Poetry and letters. Cultural, historical, religious, and political climate of his day. Influence upon artists. Critical reception. Repeat credit for students who have completed 3334W. [3] (HCA)

**HART 3334W. Michelangelo's Life and Works.** [Formerly HART 220W] Sculpture, painting, architecture, and graphic works. Poetry and letters. Cultural, historical, religious, and political climate of his day. Influence upon artists. Critical reception. Repeat credit for students who have completed 3334. [3] (HCA)

**HART 3364W. The Court of Burgundy.** [Formerly HART 213W] The visual arts of the Dukes of Burgundy (1363-1477) in cultural context. Portraiture, chivalry, costume, storytelling, and ceremony. Artists include Claus Sluter, Jan van Eyck, and Rogier van der Weyden. [3] (HCA)

**HART 3718W. Twentieth-Century Mexican Art: Painting, Cinema, Literature.** [Formerly HART 236W] From muralism to performance art. Relationship between artistic style and historical context. Analysis of ideological content. Rivera, Orozco, Kahlo, Modotti, Paz. Offered on a graded basis only. [3] (HCA)

**HART 3730. Twentieth-Century Sculpture.** [Formerly HART 234] Definitions, materials, movements, theories, and related practices, including architecture. [3] (HCA)

**HART 3735. History of Photography.** [Formerly HART 233] Uses and meanings of photography from its invention (c. 1839) to the present. Ways of thinking about the medium and its status as a separate discipline in relation to the history of art. [3] (HCA)

**HART 3740. History of Sound Art.** [Formerly HART 243] From twentieth century to present. Use of sound as artistic medium. Experimental practices; the relationship of art and technology; sound art's position between music, performance and installation art. Cage, Cardiff, Paik, Rosenfeld, and Trimpin. [3] (HCA)

**HART 3767W. Neo-Dada and Pop Art.** Artistic movements at the end of modernism and beginning of postmodernism, 1955-1980. Intersection with music, consumer culture, advertising, and economics. Jackson Pollock, Robert Rauschenberg, Jasper Johns, Andy Warhol, and Roy Lichtenstein. Issues of gender and sexuality through construction of femininity and masculinity. [3] (US)

**HART 3810W. Exhibiting Historical Art.** [Formerly HART 280W] Research and exhibition of art in the permanent collection of the Vanderbilt University Fine Arts Gallery. Research methods and principles of object organization and display, illustrated via selected objects that vary annually. [3] (HCA)

**HART 3840. Directed Study.** [Formerly HART 290] Registration only with agreement of instructor involved and with written approval of the director of undergraduate studies. May be repeated for a total of 6 credits, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of HART 3840] (No AXLE credit)

**HART 3850. Independent Research.** [Formerly HART 289] Supervised work in extension of regular offerings in the curriculum. Registration only with agreement of instructor involved and with written approval of the director of undergraduate studies. May be repeated for a total of 6 credits, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

**HART 3880. Internship Training.** [Formerly HART 293B] Students gain experience in a broad range of arts-related programs, at public or private institutions, including museums, and/or federal agencies. Students

may take 1-3 hours in 3883, which includes background research, done concurrently with a one-semester internship program (3880), leading to submission of a research paper at the end of that semester. A 3.0 grade point average, approval of a specific plan by the department, and at least 6 hours of prior work in History of Art is required. Offered only on a pass/fail basis only and must be taken concurrently with 3883. Will not count as part of the minimum hours for the History of Art major or minor. Corequisite: 3883. [Variable credit: 1-9] (No AXLE credit).

**HART 3883. Internship Research.** [Formerly HART 293A] Students gain experience in a broad range of arts-related programs, at public or private institutions, including museums, and/or federal agencies. Students may take 1-3 hours in 3883, which includes background research, done concurrently with a one-semester internship program (3880), leading to submission of a research paper at the end of that semester. A 3.0 grade point average, approval of a specific plan by the department, and at least 6 hours of prior work in History of Art is required. Readings and critiqued assignments under faculty supervision. Will not count as part of the minimum hours for the History of Art major or minor. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit).

**HART 3890. Selected Topics.** [Formerly HART 288] May be repeated for credit twice if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 9 credits total for all semesters of HART 3890] (No AXLE credit)

**HART 4960. Advanced Seminar.** [Formerly HART 295] An undergraduate seminar involving advanced in-depth reading, research, and writing in a particular area of art history. Limited to juniors and seniors with preference to majors. May be repeated for credit once if there is no duplication in topic and not twice from the same instructor. Students may enroll in more than one section of this course each semester. Offered on a graded basis only. [3; maximum of 6 credits total for all semesters of 295; maximum of 9 credits for HART Honors candidates] (HCA)

**HART 4998. Honors Research.** [Formerly HART 298] Research to be done in consultation with a member of the faculty in history of art. Open only to those beginning honors work in history of art. May be repeated for a total of 6 credits. [1-6; maximum of 6 credits total for all semesters of HART 4998] (No AXLE credit)

**HART 4999. Honors Thesis.** [Formerly HART 299] Open only to seniors in the departmental honors program. Students completing this course with distinction, including a thesis and final examination, will earn honors in history of art. Prerequisite: 4998. May be repeated for a total of 6 credits. [1-6; maximum of 6 credits total for all semesters of HART 4999] (No AXLE credit)

## Honors

**HONS 1810W. College Honors Seminar in the Humanities and Creative Arts.** [Formerly HONS 181] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (HCA)

**HONS 1820W. College Perspectives Honors Seminar.** [Formerly HONS 182] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (P)

**HONS 1830W. College Honors Seminar in Behavioral and Social Sciences.** [Formerly HONS 183] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (SBS)

**HONS 1840W. College Honors Seminar in History and Culture of the United States.** [Formerly HONS 184] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (US)

**HONS 1850W. College Honors Seminar in Mathematics and Natural Science.** [Formerly HONS 185] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but



students may earn only up to 6 credits per semester of enrollment. [3] (MNS)

**HONS 1860W. College Honors Seminar in International Cultures.** [Formerly HONS 186] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (INT)

## Humanities

**HUM 1610. Selected Topics.** [Formerly HUM 161] Topics Vary. May be repeated more than once if there is no duplication of topic. [3] (No AXLE credit)

## Interdisciplinary Studies

**INDS 3831. Global Citizenship and Service.** [Formerly INDS 270A] This course is offered by the Vanderbilt Initiative for Scholarship and Engagement (VISAGE). Graduate students may take this course for graduate credit. A service-learning course introducing students to themes and interpretations of global citizenship. Intended to be followed by 3832. [3] (INT)

**INDS 3832. Global Community Service.** [Formerly INDS 270B] This course is offered by the Vanderbilt Initiative for Scholarship and Engagement (VISAGE). Graduate students may take this course for graduate credit. Students will design and conduct research projects in collaboration with faculty mentors. Prerequisite: 3831. [1-3] (No AXLE credit)

**INDS 3833. Seminar in Global Citizenship and Service.** [Formerly INDS 270C] This course is offered by the Vanderbilt Initiative for Scholarship and Engagement (VISAGE). Graduate students may take this course for graduate credit. Project- and research-based seminar drawing on student experiences and learning in 3831 and 3832. Prerequisite: 3832. [3] (INT)

**INDS 3880. Interdisciplinary Internship.** [Formerly INDS 280A, 280B, 280C] Internship credit for work approved by the designated Associate Dean of Arts and Science. A written scholarly project must be produced in the internship. Must be taken P/F. Repeatable twice for a maximum of 3 credit hours in 3880 (and 3884) combined. [1] (No AXLE credit)

**INDS 3884. Interdisciplinary Internship.** [Formerly INDS 280D] Internship credit for summer work approved by the designated Associate Dean of Arts and Science. A written scholarly project must be produced in the internship. Course must be taken P/F. May be repeated for credit; maximum of 3 credit hours in 3881, 3882, 3883, and 3884 combined. [1] (No AXLE credit)

## Italian

**ITA 1001. Commons Seminar.** [Formerly ITA 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**ITA 1101. Elementary Italian.** [Formerly ITA 101A] Introduction to reading, writing, and speaking through an exploration of Italian culture. For students who have studied little or no Italian. No credit for students who have earned credit for a more advanced Italian language course. [3] (No AXLE credit)

**ITA 1102. Elementary Italian.** [Formerly ITA 101B] Study of the language through an exploration of Italian culture. No credit for students who have earned credit for a more advanced Italian language course. Prerequisite: 1101. [3] (INT)

**ITA 1103. Intensive Elementary Italian.** [Formerly ITA 102] One-semester intensive course for students who have some knowledge of Italian or of another romance language. No credit for students who have earned credit for 1101, 1102, or a more advanced Italian language course. [3] (INT)

**ITA 1111. First-Year Writing Seminar.** [Formerly ITA 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits

in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**ITA 2203. Italian Journeys.** [Formerly ITA 200] Life and art in the diverse regions of Italy through an integrated four-skills approach of reading, writing, listening and speaking. No credit for students who have earned credit for a more advanced Italian language course. Prerequisite: 1102 or 1103. [3] (INT)

**ITA 2501W. Grammar and Composition.** [Formerly ITA 201W] Syntax, idiomatic expressions, and current usage. No credit for students who have earned credit for a more advanced Italian language course. Prerequisite: 2203. [3] (INT)

**ITA 2614. Conversation.** [Formerly ITA 214] Development of oral proficiency through analysis and discussion of films, magazine articles, and contemporary art and literature. Prerequisite: 2203. [3] (INT)

**ITA 3000. Introduction to Italian Literature.** [Formerly ITA 220] Critical reading of major works of Italian literature from the beginning to the present. Prerequisite: 2501W. [3] (HCA)

**ITA 3041. Italian Civilization.** [Formerly ITA 230] The politics, intellectual, social, artistic, and economic history of Italy from 1300 to the present, with emphasis on major political and philosophical authors. Taught in English. [3] (INT)

**ITA 3100. Literature from the Middle Ages to the Renaissance.** [Formerly ITA 232] The ideas and forms of the Trecento, Quattrocento, and Cinquecento, as reflected in the philosophy, history, literature, and art history of these periods. Major writers and their influence on Western European literatures. Prerequisite: 2501W. [3] (HCA)

**ITA 3240. Dante's *Divine Comedy*.** [Formerly ITA 231] Dante's language and philosophical tenets through the study of style, characters, and themes. Taught in English. [3] (HCA)

**ITA 3242. Dante in Historical Context.** [Formerly ITA 288] Dante's philosophical and critical works in their medieval historical context and his influence in building a modern Western civilization. Knowledge of Italian not required. [3] (HCA)

**ITA 3340. *Famous Women* by Boccaccio.** [Formerly ITA 250] Boccaccio's *Famous Women*, the first collection of female biographies. Evolution of the literary representation of women from classical times to the Renaissance. Contemporary criticism and theory. Taught in English. [3] (HCA)

**ITA 3500. Baroque, Illuminismo, and Romanticism in Italy.** [Formerly ITA 233] Literature of the seventeenth through nineteenth centuries, with particular reference to the influence of European literatures in Italy. Prerequisite: 2501W. [3] (HCA)

**ITA 3600. Twentieth-Century Literature: Beauty and Chaos.** [Formerly ITA 235] Poetry and prose in social and historical context. Prerequisite: 2501W. [3] (HCA)

**ITA 3640. Classic Italian Cinema.** [Formerly ITA 240] From the 1910s to the 1970s. Selected works from Neorealism to Art Film. Relationship between cinema and the other arts. Contrasting film styles, including abstraction and realism, and tradition and transgression. Knowledge of Italian is not required. [3] (INT)

**ITA 3641. Contemporary Italian Cinema.** [Formerly ITA 241] From the 1970s to the present. Postmodern forays into metafiction, parody, and political and social critique. The return to realism and New Regionalism in the twenty-first century. Knowledge of Italian is not required. [3] (HCA)

**ITA 3642. Italian Visual Culture.** [Formerly ITA 280] Parallels between Italian literature and the visual arts, including painting, cinema, and intermediality. Focus on the representation of the visual arts in literature, the representation of literature in the visual arts, and Italy as the cradle of Western visual culture. Prerequisite: 2203. [3] (HCA)

**ITA 3701. City Fictions.** [Formerly ITA 238] Interdisciplinary exploration of how Italian authors, directors, and artists aspire to change the way readers and viewers understand and experience urban realities. Social, cultural, geographical, and architectural aspects of Italian cities as depicted in fiction, travel literature, cinematic images, the visual arts, and music. Prerequisite: 2203. [3] (P)

**ITA 3702. Topics in Contemporary Italian Civilization.** [Formerly ITA 239] Short stories, historical documents, and articles from the press. Prerequisite: 2501W. [3] (No AXLE credit)

**ITA 3740. Gangsters, Lovers, Madonnas, and Mistresses.** [Formerly ITA 236] The history of Italian immigration in the United States. American representations of Italians and Italian-Americans from 1900 to the present. Cinematographic and literary images of Italians and Italian Americans. Historical and anthropological scholarship. Films, fiction, ethnic marketing, and travel writing. Knowledge of Italian is not required. [3] (US)

**ITA 3802. Contemporary Italian Society and Culture.** [Formerly ITA 242] Capitalism and modernization, immigration, and multiculturalism. Racism, youth culture, gender, sexuality, and feminism. Changing definitions of family. Regionalism, entertainment, and sport. Prerequisite: 2203. [3] (P)

**ITA 3803. Mediterranean Culture (taught in Sicily and Italy).** [Formerly ITA 243] Culture and history of the Mediterranean. Taught in Sicily and the Italian peninsula. Knowledge of Italian is not required. [3] (HCA)

**ITA 3850. Independent Study.** [Formerly ITA 289] A reading course, the content of which varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available in the regular curriculum. May be repeated for a total of 12 credits over a four-semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of ITA 3850] (No AXLE credit)

**ITA 3890. Special Topics in Italian Literature.** [Formerly ITA 294A] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2501W. [3] (No AXLE credit)

## Japanese

**JAPN 1011. Basic Japanese I.** [Formerly JAPN 200A] Simple conversation, writing system, and reading. Designed exclusively for students with little or no previous exposure to Japanese. No credit for students who have earned credit for 1101 or a more advanced Japanese language course. [3] (No AXLE credit)

**JAPN 1012. Basic Japanese II.** [Formerly JAPN 200B] No credit for students who have earned credit for 1101 or a more advanced Japanese language course. Prerequisite: 1011. [3] (No AXLE credit)

**JAPN 1101. Elementary Japanese I.** [Formerly JAPN 201] Acquisition of oral-aural skills and basic grammar. Introduction to reading and writing Japanese syllabaries and Chinese characters. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for 1012 or a more advanced Japanese language course. [5] (No AXLE credit)

**JAPN 1102. Elementary Japanese II.** [Formerly JAPN 202] Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 1012 or 1101. [5] (INT)

**JAPN 2201. Intermediate Japanese I.** [Formerly JAPN 211] Development of conversational skills and linguistic competence. Syntax, writing, and reading. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 1102. [5] (INT)

**JAPN 2202. Intermediate Japanese II.** [Formerly JAPN 212] Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 2201. [5] (INT)

**JAPN 2232. Japanese through Manga.** [Formerly JAPN 232] Reading and analysis of Japanese comic books. Language skills and knowledge of contemporary Japanese popular culture. Basic knowledge of hiragana and katakana required. [1] (No AXLE credit)

**JAPN 3301. Advanced Japanese I.** [Formerly JAPN 241] Reading and writing in contemporary Japanese texts. Conversation, discussion, and

development of pragmatic competence. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 2202. [3] (INT)

**JAPN 3302. Advanced Japanese II.** [Formerly JAPN 242] No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 3301. [3] (INT)

**JAPN 3851. Independent Study.** [Formerly JAPN 289A] A reading course which may be repeated with variable content according to the needs of the individual student. Primarily designed to cover materials not otherwise available in the regular curriculum. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for all semesters of JAPN 3851 and 3852] (No AXLE credit)

**JAPN 3852. Independent Study.** [Formerly JAPN 289B] A reading course which may be repeated with variable content according to the needs of the individual student. Primarily designed to cover materials not otherwise available in the regular curriculum. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for all semesters of JAPN 3851 and 3852] (No AXLE credit)

**JAPN 3891. Special Topics in Advanced Japanese.** [Formerly JAPN 251] Reading, writing, and discussion in authentic Japanese cultural, literary, and historical texts. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3302. [3] (INT)

## Jewish Studies

**JS 1001. Commons Seminar.** [Formerly JS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**JS 1002. Introduction to Jewish Studies.** [Formerly JS 180] Introduction to Judaism and Jewish history through philosophical, political, social, psychological, and artistic perspectives. Biblical studies; and culture, philosophy, and literature. Antiquity and the medieval world; modern and contemporary experience. Repeat credit for students who have completed 1002W. [3] (INT)

**JS 1002W. Introduction to Jewish Studies.** [Formerly JS 180W] Introduction to Judaism and Jewish history through philosophical, political, social, psychological, and artistic perspectives. Biblical studies; culture, philosophy, and literature. Antiquity and the medieval world; modern and contemporary experience. Repeat credit for students who have completed 1002. [3] (INT)

**JS 1111. First-Year Writing Seminar.** [Formerly JS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**JS 1200. Classical Judaism: Jews in Antiquity.** [Formerly JS 122] History of the Jewish people from biblical origins through the 2nd century CE. The Hellenistic Age, the Age of the Maccabees, Roman rule, and the rise of the Rabbis and Rabbinic literature. [3] (HCA)

**JS 1220. Jews in the Medieval World.** [Formerly JS 123] Jewish experience from the 2nd century CE to 1492. Legal status of Jews; economic and religious developments. Burning the Talmud, age of charters, reaction to the Crusades, Jewish expulsion from Spain. [3] (INT)

**JS 1240. Perspectives in Modern Jewish History.** [Formerly JS 124] Meaning and origins of modern Jewish history from 1492. The diverse experiences of Jewish communities across the globe. Men's and women's redefinition of Jewish identity as they confronted modernity. Rise of secular rights for Jews but also of new forms of persecution. [3] (P)

**JS 2100. The New Testament in Its Jewish Contexts.** [Formerly JS 219] Documents of the origin of Christianity and the social, literary, ideological, and theological contexts in which they emerged and which they reflect. Various critical methodologies employed in interpreting them. [3] (P)

**JS 2150. Issues in Rabbinic Literature.** [Formerly JS 233] History of Rabbinic thought from its origins to the Middle Ages through the reading of central Rabbinic texts. Capital punishment, women in Rabbinic culture, sectarianism, and the power structures of Roman Palestine and Sasanian Babylonia. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (INT)

**JS 2210W. Hebrew Literature in Translation.** [Formerly JS 235W] Origins and development in Eastern Europe from the nineteenth century to postmodern Israeli literature. The relationship between historical transformations and literary form. [3] (INT)

**JS 2220. Israeli Culture through Film.** Cinematic representations of modern Israeli culture. Historical, social, and political aspects. Constructions of national identity. Treatments of war and conflict, ethnicity, gender, and Zionism. [3] (INT)

**JS 2230W. American Southern Jews in Life and Literature.** [Formerly JS 162W] From colonial times to the present. Interactions between Southern Jews and other Southerners, and between Southern and Northern Jews. The Civil War, Jewish economic activities, and the civil rights movement. [3] (US)

**JS 2240W. Black-Jewish Relations in Post-War American Literature and Culture.** [Formerly JS 137W] The historical relationship between African Americans and Jewish Americans and its portrayal in novels, short stories, and films by artists from both communities. [3] (US)

**JS 2250W. Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors.** [Formerly JS 253W] Fiction and non-fiction produced by children of Holocaust survivors. [3] (HCA)

**JS 2260. Coming of Age in Jewish Literature and Film.** [Formerly JS 237] The transition of young Jewish protagonists into adulthood as portrayed in literary works and films from Europe, Africa, and the Americas. Repeat credit for students who have completed 2260W. [3] (INT)

**JS 2260W. Coming of Age in Jewish Literature and Film.** [Formerly JS 237W] The transition of young Jewish protagonists into adulthood as portrayed in literary works and films from Europe, Africa, and the Americas. Repeat credit for students who have completed 2260. [3] (INT)

**JS 2270. Jewish Storytelling.** [Formerly JS 248] Twentieth-century short fiction and narrative traditions. The transition from religious to secular cultural forms. Immigration and ethnic literary forms. All works are in English or English translation from Yiddish, Hebrew, and Russian. Repeat credit for students who have completed 2270W. [3] (HCA)

**JS 2270W. Jewish Storytelling.** [Formerly JS 248W] Twentieth-century short fiction and narrative traditions. The transition from religious to secular cultural forms. Immigration and ethnic literary forms. All works are in English or English translation from Yiddish, Hebrew, and Russian. Repeat credit for students who have completed 2270. [3] (HCA)

**JS 2280. Jewish Humor.** [Formerly JS 138] The flowering of Jewish humor, especially in the U.S. during the twentieth century. Vaudeville, radio comedy, and the Golden Age of television. The careers and works of influential comics, writers and filmmakers, and the development of stand-up comedy. The effect of Talmudic disputes, Yiddish wordplay, and the history of Diaspora life upon secular Jewish comedians, essayists, playwrights, and fiction writers. Repeat credit for students who have completed 2280W. [3] (US)

**JS 2280W. Jewish Humor.** [Formerly JS 138W] The flowering of Jewish humor, especially in the U.S. during the twentieth century. Vaudeville, radio comedy, and the Golden Age of television. The careers and works of influential comics, writers and filmmakers, and the development of stand-up comedy. The effect of Talmudic disputes, Yiddish wordplay, and the history of Diaspora life upon secular Jewish comedians, essayists, playwrights, and fiction writers. Repeat credit for students who have completed 2280. [3] (US)

**JS 2290W. Imagining the Alien: Jewish Science Fiction.** [Formerly JS 136W] Science fiction and speculative fiction by Jewish writers in cultural context. Aliens, robots, and secret identities; time travel; utopia and political critique; questions of Jewish identity. [3] (HCA)

**JS 2300. Modern Jewish Thought.** [Formerly JS 240] Jewish intellectual responses to major transformations of modernity. Impact of secularization, universalism, pluralism, nationalism, and gender theories on Jewish thought and identity. Conflicting perspectives of tradition, education, culture, and religion. Relationship between Israel and the diaspora. [3] (P)

**JS 2320. Freud and Jewish Identity.** [Formerly JS 244] Analysis of rhetoric and themes in selected writings of Sigmund Freud and his times, development of assimilation and of anti-Semitic repudiation. [3] (SBS)

**JS 2330. Is G-d Guilty? The Problem of Evil in Judaism.** [Formerly JS 250] Origin, nature, and representations of evil from Scripture through the Hasidic masters. Reflections of modern thinkers. [3] (HCA)

**JS 2340. Jewish Philosophy after Auschwitz.** [Formerly JS 249] Critical responses to social and political institutions and the corresponding modes of thought that made Auschwitz possible and continue to sustain the barbarism that many leading philosophers have identified at the heart of culture. [3] (INT)

**JS 2400. American Jewish Life.** [Formerly JS 155] Diversity, individualism, and change in Jewish life. Food and culture, memory and identity, gender and assimilation, Reform-Conservative-Orthodox culture wars. [3] (SBS)

**JS 2420W. American Jewish Music.** [Formerly JS 139W] From the late 19th century to the present. Distinctiveness of Jewish songs. Contributions of Jewish songwriters to American music. [3] (US)

**JS 2450. The Jewish Diaspora.** [Formerly JS 158] Changing Jewish communities, especially outside the United States and Israel, in macro-historical context. Post-communist European Jewish identity. New global diasporas and their relationship to the largest Jewish communities in Israel and the United States. [3] (INT)

**JS 2500. Modern Israel.** [Formerly JS 125] Internal dynamics, debates, and conflicts within Israeli society. Political, social, and cultural transformations from the 1980s to the present. [3] (INT)

**JS 2520. Zionism: Politics, Religion, and Ethnicity.** [Formerly JS 255] Tensions among religion, nationalism, and political activism. Translations of Messianism into a secular program. Criticism from within and without the movement. [3] (HCA)

**JS 2540. Power and Diplomacy in the Modern Middle East.** [Formerly JS 256] History of the Middle East in the 19th and 20th centuries with an emphasis on U.S. involvement after 1945. U.S. relationship with Israel, and its impact on the region. [3] (INT)

**JS 2560. Social Movements in Modern Jewish Life.** [Formerly JS 252] How social movements shape contemporary American Jewish culture and politics. Explores movements internal to Judaism and those bringing religion into the public sphere. [3] (SBS)

**JS 2600. Islam and the Jews.** [Formerly JS 120] Muslim-Jewish relations from the beginning of Islam to the present. Mohammed and the Jews, Jewish roles in Islamic cultures, status of Muslims in contemporary Israel, recent Jewish exodus from Muslim lands. [3] (INT)

**JS 2620. Jews in Egypt.** [Formerly JS 222] Jewish life and experience under Egyptian, Greek, Roman, and Muslim rule in Egypt from the Ptolemies to 1956. Jewish self-government, economic life, and culture over twenty-two centuries, through letters, documents, and imaginative literature. [3] (INT)

**JS 2640. Jews and Greeks.** [Formerly JS 230] From the seventh century BCE to ca. 1500 CE. Sites of interaction, languages, cultural ties, religious tensions, political conflicts, and competing philosophies. Works by Elephantine, Alexander the Great, the Maccabees, the Septuagint, Aristaeas, Josephus, Philo, the rabbis, the New Testament, Ezekiel the Tragedian, Byzantium. Serves as repeat credit for students who completed 257 section 1 in fall 2010. [3] (INT)

**JS 3000. Major Themes in Jewish Studies.** [Formerly JS 245] The study of Jews, Judaism, and Jewish culture. History of Jewish Studies, core perspectives, key methodologies, critical debates. Classical literature, current trends. [3] (P)

**JS 3100. The Holocaust.** [Formerly JS 156] The history of the Holocaust: its origins, development, and its legacy in the context of Germany and European history. [3] (INT)

**JS 3210. Reading Across Boundaries: Jewish and Non-Jewish Texts.** [Formerly JS 234] Jewish and non-Jewish literary and historical texts studied in parallel so as to discover the differences between them. The course will consider texts from the ancient world to the early modern period and ask what constitutes Jewish writing and how it has been defined through time and geography. All readings will be in English. [3] (INT)

**JS 3830. Contemporary Jewish Issues.** [Formerly JS 280] Projects will vary according to the instructor. Service to community will be integral part of course. [3] (No AXLE credit)

**JS 3840. Directed Readings.** [Formerly JS 290] Advanced readings and research on a selected topic done under the supervision of a faculty mentor. [3] (No AXLE credit)

**JS 3850. Independent Study.** [Formerly JS 289] A research project carried out under the supervision of a faculty mentor. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of JS 3850] (No AXLE credit)

**JS 3880. Internship Training.** [Formerly JS 288A] Under faculty supervision, students gain experience in any of a variety of settings, such as community, municipal, or government agencies. A thorough report and research paper are required. Must be taken on a Pass/Fail basis only and must be taken concurrently with 3883. Corequisite: 3883. [Variable credit: 1-3] (No AXLE credit)

**JS 3883. Internship Research.** [Formerly JS 288B] Under faculty supervision, students gain experience in any of a variety of settings, such as community, municipal, or government agencies. A thorough report and research paper are required. Students will write a research paper drawing on their experiences in 3880. Corequisite: 3880. [3] (No AXLE credit)

**JS 3890. Special Topics.** [Formerly JS 284] Topics as announced. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**JS 3892. Topics in Ancient and Medieval Jewish History.** [Formerly JS 257] From antiquity to 1492. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**JS 3894. Topics in Modern Jewish History.** [Formerly JS 258] From 1492 to the present. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**JS 4301. Jewish Language and Paleography.** [Formerly JS 238] Advanced study in a language of the Jewish people with a particular focus on the linguistic and paleographic features that define its cultural context. Each section focuses on one of the following languages: Aramaic, Ladino, Judaeo-Arabic, Rabbinic Hebrew, or Yiddish. May be repeated for credit up to two times when the language studied differs. Consent of instructor required. [3] (INT)

**JS 4960. Senior Seminar.** [Formerly JS 295] Advanced reading and research in a particular area of Jewish studies. [3] (No AXLE credit)

**JS 4970. Senior Project in Jewish Studies.** [Formerly JS 296] Readings and independent research. Prerequisite: senior standing. [3] (No AXLE credit)

**JS 4980. Senior Honors Research Seminar.** [Formerly JS 298A] Presentation and discussion of progress being made on honors theses. Open only to senior departmental honors students. [3] (No AXLE credit)

**JS 4981. Senior Honors Research Seminar.** [Formerly JS 298B] Presentation and discussion of progress being made on honors theses. Open only to senior departmental honors students. [3] (No AXLE credit)

## K'iche' – Mayan Language

**KICH 1101. Elementary K'iche' I.** Kaqchikel, K'iche', or Q'eqchi'. Basic speaking, reading, and writing skills. Offered on a graded basis only. Serves as repeat credit for students who have earned credit for ANTH 2612. [3] (No AXLE credit)

**KICH 1102. Elementary K'iche' II.** Intermediate level course with advanced grammar. Counterfactual constructions, deixis, verbal derivations of positional roots, sound symbolic verbs, and verbal nominalizations. Vocabulary and idioms. Various literary genres. No credit for students who have earned credit for ANTH 2614. Offered on a graded basis only. Prerequisite: 1101 or ANTH 2612. [3] (INT)

**KICH 2201. Intermediate K'iche' I.** Vocabulary, listening, and speaking skills. Modern and colonial texts. Cultural context of linguistic practices in K'iche' communities. No credit for students who have earned credit for Anthropology 278. Offered on a graded basis only. Prerequisite: 1102. [3] (INT)

**KICH 2202. Intermediate K'iche' II.** Taught in K'iche'. Advanced vocabulary, grammar, syntax, reading, and writing. Colonial and modern texts. No credit for students who have earned credit for ANTH 3615. Offered on a graded basis only. Prerequisite: 2201 or ANTH 3614. [3] (INT)

## Latin

**LAT 1101. Beginning Latin I.** [Formerly LAT 101] Practice in speaking and writing. No credit for students who have earned credit for a more advanced Latin language course. Graded basis only. [3] (No AXLE credit)

**LAT 1102. Beginning Latin II.** [Formerly LAT 102] Transition to literary Latin. Emphasis on comprehension of texts. No credit for students who have earned credit for a more advanced Latin language course. Graded basis only. Prerequisite: 1101. [3] (INT)

**LAT 1103. Intensive Elementary Latin.** [Formerly LAT 100] The equivalent of Latin 1101 and 1102. This course presents the elements of the Latin language at an accelerated pace. Designed for students who have completed one or two years of Latin in high school but are not prepared to enter Latin 1102. No credit for students who have earned credit for 1101, 1102, or a more advanced Latin language course. [5] (INT)

**LAT 2201. Intermediate Latin: Prose.** [Formerly LAT 103] Review of Latin grammar and selected reading from major Latin authors. No credit for students who have earned credit for a more advanced Latin language course except 2202. [3] (INT)

**LAT 2202. Intermediate Latin: Poetry.** [Formerly LAT 104] Selected reading from the major Latin poets. No credit for students who have earned credit for a more advanced Latin language course. [3] (INT)

**LAT 3010. The Writings of Caesar.** [Formerly LAT 218] Selections from *The Civil War* and *The Gallic War*. Literary style and historical context. Prerequisite: 2202. [3] (HCA)

**LAT 3020. Cicero and the Humanistic Tradition.** [Formerly LAT 206] Study of Cicero's career and thought, and of his contribution to the development of the concept of humanitas. Readings from his letters, speeches, or philosophical works. Prerequisite: 2202. [3] (HCA)

**LAT 3030. Latin Letters.** [Formerly LAT 205] The literary letters of Seneca and Pliny, with a brief introduction to the personal correspondence of Cicero and the letters discovered at Vindolanda. Prerequisite: 2202. [3] (HCA)

**LAT 3040. The Roman Historians.** [Formerly LAT 215] Selections from Sallust, Livy, and Tacitus, with attention to their objectives and methods; analysis of Roman historiography and its relation to Greek and early Christian historiography. Prerequisite: 2202. [3] (HCA)

**LAT 3050. Suetonius.** [Formerly LAT 217] Selections from the works of one of Rome's most important biographers, read in the context of the

Latin biographical tradition as well as the political and social background. Prerequisite: 2202. [3] (HCA)

**LAT 3060. Tacitus.** [Formerly LAT 216] Selections from the works of one of Rome's most important historians, read in the context of historiographical tradition and political and social background. Prerequisite: 2202. [3] (HCA)

**LAT 3100. Roman Comedy.** [Formerly LAT 212] Reading of selected comedies of Plautus and Terence: study of the form of Roman comedy and its relation to the Greek New Comedy. Prerequisite: 2202. [3] (HCA)

**LAT 3110. Catullus.** [Formerly LAT 201] Reading and interpretation of Catullus' poems; aesthetic, political, and rhetorical contexts; fundamentals of Latin meter. Prerequisite: 2202. [3] (HCA)

**LAT 3120. Lucretius: *De Rerum Natura*.** [Formerly LAT 268] Lucretius' poem studied both in the tradition of Epicurean philosophy and as a landmark in the development of the Latin didactic epic; background material in the fragments of Epicurus and some treatment of the Epicurean movement in Italy and especially in Rome. Prerequisite: 2202. [3] (HCA)

**LAT 3130. Vergil: *The Aeneid*.** [Formerly LAT 220] An intensive study of the entire poem, in the context of the epic tradition. Prerequisite: 2202. [3] (HCA)

**LAT 3140. The Lyric Poetry of Horace.** [Formerly LAT 203] Reading and interpretation of Horace's Epodes and Odes; relation to the Greco-Roman lyric tradition and to Augustan politics. Prerequisite: 2202. [3] (HCA)

**LAT 3150. Latin Elegy.** [Formerly LAT 204] Authors who created a new type of love poetry during the rule of emperor Augustus: Tibullus, Propertius, Ovid, and Sulpicia. Construction and contestation of gender roles; political contexts; development of the elegiac couplet; modern responses. Prerequisite: 2202. [3] (HCA)

**LAT 3160. Ovid.** [Formerly LAT 202] Reading and interpretation of selections from the *Metamorphoses* or other works of Ovid. Prerequisite: 2202. [3] (HCA)

**LAT 3170. Roman Satire.** [Formerly LAT 264] The satires of Horace and Juvenal; the origins of Roman satire; history and conventions of the genre; background reading in other Roman satirists. Prerequisite: 2202. [3] (HCA)

**LAT 3180. Neronian Writers.** [Formerly LAT 267] Selections from authors in the literary renaissance during the reign of the artistic Emperor Nero, including Seneca, Lucan, Persius, and Petronius. Stylistic innovations, literary merits, and cultural contexts. Prerequisite: 2202. [3] (HCA)

**LAT 3200. Early Christian Writers.** [Formerly LAT 260] Selections from the writings of Latin Christians, from the account of Perpetua's martyrdom to the Confessions of Augustine. Prerequisite: 2202. [3] (HCA)

**LAT 3850. Independent Study.** [Formerly LAT 289] Designed for majors wanting to familiarize themselves with works or authors not covered in the regular curriculum. Prerequisite: 6 hours above 2202. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of LAT 3850] (No AXLE credit)

**LAT 3890. Special Topics in Latin Literature.** [Formerly LAT 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

## Latin American Studies

**LAS 1001. Commons Seminar.** [Formerly LAS 99] Topics vary. General Elective credit only. [1] (No AXLE credit.)

**LAS 1111. First-Year Writing Seminar.** [Formerly LAS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**LAS 2101. Introduction to Latin America.** [Formerly LAS 201] A multidisciplinary survey of Latin America from pre-Columbian times to the present emphasizing culture, economic and political patterns, social issues, literature, and the arts in a historical perspective. [3] (INT)

**LAS 2102. Introduction to Brazil.** [Formerly LAS 202] A multidisciplinary survey of Brazil from pre-Columbian times to the present, emphasizing culture, economic and political patterns, social issues, literature, and the arts in historical perspective. [3] (INT)

**LAS 2301. Music of Protest and Social Change in Latin America.** [Formerly LAS 231] Politics of musical culture. Music both as a marker of sociopolitical change and as an agent of political transformation. [3] (INT)

**LAS 2601. Latin America, Latinos, and the United States.** [Formerly LAS 260] Immigration of Latin American and Caribbean peoples to the United States and their experiences in this country. Required service work and a research project in the Nashville Latino community. [3] (P)

**LAS 3851. Independent Study.** [Formerly LAS 289A] A program of independent readings or research to be selected in consultation with the center's undergraduate adviser. Open only to juniors and seniors. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of LAS 3851 and 3852] (No AXLE credit)

**LAS 3852. Independent Study.** [Formerly LAS 289B] A program of independent readings or research to be selected in consultation with the center's undergraduate adviser. Open only to juniors and seniors. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of LAS 3851 and 3852] (No AXLE credit)

**LAS 3880. Internship Training.** [Formerly LAS 280B] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Latin America. Background reading and research will be completed in Latin American Studies 3881 concurrently with the completion of internship training, Latin American Studies 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, 6 hours of prior work in Latin American Studies, and prior approval of the director of undergraduate studies of the student's plans are required. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 cannot be included in the minimum number of hours counted toward the Latin American Studies major or minor. Corequisite: 3881. [1-9] (No AXLE credit)

**LAS 3881. Internship Readings and Research.** [Formerly LAS 280A] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Latin America. Background reading and research will be completed in Latin American Studies 3881 concurrently with the completion of internship training, Latin American Studies 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, 6 hours of prior work in Latin American Studies, and prior approval of the director of undergraduate studies of the student's plans are required. Corequisite: 3880. [3-6] (No AXLE credit)

**LAS 3891. Special Topics in Latin American Studies.** [Formerly LAS 294A] Selected special topics suitable for interdisciplinary examination from the perspective of the social sciences and humanities. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**LAS 4901. Interdisciplinary Research Methods.** [Formerly LAS 290] Principal research methods and sources necessary for the study of Latin America in the social sciences and humanities. [3] (No AXLE credit)

## Latino and Latina Studies

**LATS 2201. Introduction to Latino and Latina Studies.** [Formerly LATS 201] Foundational course for interdisciplinary study of Americans of Hispanic heritage and their communities. History and cultural production. Interconnections and differences among diverse Hispanic communities. [3] (P)

**LATS 3831. Latino and Latina Business and Entrepreneurship.** [Formerly LATS 250] Research on Nashville's growing Latino and Latina communities. Types of businesses and how they function. Issues affecting businesses within the communities. Work with local community leaders. A service learning course. [3] (SBS)

**LATS 4961. Latino and Latina Studies Seminar.** [Formerly LATS 280] Overview of cultural production, history, and political and socioeconomic experiences of Hispanic people living in the United States. Synthesis of issues, traditions, approaches, and problems. [3] (HCA)

## Managerial Studies

**MGRL 1001. Commons Seminar.** [Formerly MGRL 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**MGRL 1100. Fundamentals of Management.** [Formerly MGRL 194] Entrepreneurship, strategy, marketing, operations, and finance. For-profit, non-profit, and social enterprise organizations. [3] (SBS)

**MGRL 1200. Principles of Marketing.** [Formerly MGRL 190] Creating customer value and building profitable customer relationships. Understanding customer needs, defining target markets, and crafting value propositions. Case studies. [3] (SBS)

**MGRL 2300. Entrepreneurship: The Business Planning Process.** [Formerly MGRL 196] Functional areas within companies, business plans at various stages of company development and critique of business plans for investment suitability. Prerequisites: 1100 and FNEC 1600. [3] (SBS)

**MGRL 3105. Negotiation.** [Formerly MGRL 185] Contemporary challenges in leading change in organizations and building effective management teams. The context and dynamics of negotiation; components, structure, and management of negotiations; and varying requirements across the spectrum of negotiation types. [3] (SBS)

**MGRL 3200. Advanced Marketing.** [Formerly MGRL 191] Case study of processes, techniques, and theories of marketing, including branding, advertising, interactive media, sales promotion, and marketing research. Offered on a graded basis only. Prerequisite: 1200. [3] (SBS)

**MGRL 3209. Creative Advertising.** [Formerly MGRL 192] Examination and practical application of the creative process in advertising; the creation of marketing campaigns, including the integration of various media. Prerequisite: 1200. [3] (SBS)

**MGRL 3250. Corporate Strategy.** [Formerly MGRL 198] Examination of the issues and challenges facing corporate management. Responsibilities and interrelationships of functional areas including marketing, finance, operations, and R&D. Industry, competitor, and customer analysis. Design and implementation of corporate strategy. Informational and control systems. Interpersonal skills for effective teamwork. Prerequisite: FNEC 1600. [3] (SBS)

**MGRL 3300. Entrepreneurial Challenge.** [Formerly MGRL 195] Simulation of the entrepreneurial experience from idea generation to funding. Development of a complete business plan, including financial projections, and competition for funding from investors. Offered on a graded basis only. Prerequisite: 1100. [3] (SBS)

**MGRL 3841. Directed Study.** [Formerly MGRL 290] Directed readings and related field research toward a scholarly project conceived and executed under the supervision of a faculty member. Limited to juniors and seniors. [3] (No AXLE credit)

**MGRL 3851. Independent Study in Managerial Studies.** [Formerly MGRL 245] A program of independent reading in consultation with an adviser. Written permission of an instructor and the program director required. [Variable credit: 1-3; may not be repeated] (No AXLE credit)

**MGRL 3891. Selected Topics in Managerial Studies.** [Formerly MGRL 235] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

## Mathematics

**MATH 1001. Commons Seminar.** [Formerly MATH 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**MATH 1005. Pre-calculus Mathematics.** [Formerly MATH 133] Inequalities, functions and graphs, trigonometric identities, theory of equations. Designed for students who plan to take either 1200-1201 or 1300-1301 but need a stronger background in algebra and trigonometry. [3] (No AXLE credit)

**MATH 1010. Probability and Statistical Inference.** [Formerly MATH 127A] For students not planning to major in science, engineering, or mathematics. Discrete and continuous probability models (exponential, binomial, Poisson, normal). Law of large numbers; conditional probability and Bayes theorem; counting techniques and combinatorics. Descriptive statistics: measures of central tendency and dispersion, histograms. [3] (No AXLE credit)

**MATH 1011. Probability and Statistical Inference.** [Formerly MATH 127B] For students not planning to major in science, engineering, or mathematics. Linear regression, correlation, hypothesis testing. Confidence intervals, sampling distributions, statistical inference. Prerequisite: 1010. [3] (MNS)

**MATH 1100. Survey of Calculus.** [Formerly MATH 140] A basic course in the rudiments of analytic geometry and differential and integral calculus with emphasis on applications. Designed for students who do not plan further study in calculus. Students who have earned credit for 1200 or 1300 will earn only one credit for this course. Students who have earned credit for 1201 will earn only three credits for this course. [4] (MNS)

**MATH 1111. First-Year Writing Seminar.** [Formerly MATH 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**MATH 1200. Single-Variable Calculus I.** [Formerly MATH 150A] Review of algebra and trigonometry. Exponential functions; inverse functions and logarithms. Limits; differentiation of algebraic and transcendental functions; rules of differentiation; related rates. Three hours of lecture and one hour of recitation period per week. No credit for students who have earned credit for 1100. Students who have earned credit for 1300 will earn only one credit for this course. [3] (MNS)

**MATH 1201. Single-Variable Calculus II.** [Formerly MATH 150B] Maximum and minimum values; curve sketching. Antiderivatives; the Fundamental Theorem of Calculus; areas and volumes; techniques of integration. Three hours of lecture and one hour of recitation period per week. Students who have earned credit for 1100 or 1301 will earn only two credits for this course. Students who have earned credit for 1300 will earn only one credit for this course. Prerequisite: 1200. [3] (MNS)

**MATH 1300. Accelerated Single-Variable Calculus I.** [Formerly MATH 155A] Functions, limits, differentiation of algebraic functions, integration, applications including extrema problems, areas, volumes, centroids, and work. Students who have earned credit for 1100 will earn only one credit for this course. Students who have earned credit for 1200 or 1201 will earn only two credits for this course. [4] (MNS)

**MATH 1301. Accelerated Single-Variable Calculus II.** [Formerly MATH 155B] Differentiation and integration of transcendental functions, applications, methods of integration, coordinate geometry, polar

coordinates, infinite series. Students who have earned credit for 1201 will earn only three credits for this course. Students who have earned credit for 2200 will earn only one credit for this course. Prerequisite: 1300 or 1201. [4] (MNS)

**MATH 2200. Single-Variable Calculus III.** [Formerly MATH 170] Analytic geometry, parametric equations, polar coordinates, infinite series, Taylor series. Repeat credit for students who completed 170a prior to fall 2008. No credit for students who have earned credit for 1301. Prerequisite: 1201. [3] (MNS)

**MATH 2300. Multivariable Calculus.** [Formerly MATH 175] Vectors, curves, and surfaces in space. Functions of several variables, partial derivatives, multiple integrals. Vector integral calculus, including line and surface integrals. Repeat credit for students who completed 170b prior to fall 2008. No credit for students who have earned credit for 2501. Students who have earned credit for 2500 will earn only one credit for this course. Prerequisite: 1301 or 2200. [3] (MNS)

**MATH 2400. Differential Equations with Linear Algebra.** [Formerly MATH 196] Scalar differential equations, Laplace transforms, systems of differential equations. Gauss-elimination, algebra of matrices, determinants, vector spaces, linear operators, eigenvalues and eigenvectors. Intended for students in Biomedical Engineering, Electrical Engineering and Computer Engineering. No credit for students who have earned credit for 2410, 2420, or 2610. Prerequisite or corequisite: 2300. [4] (No AXLE credit)

**MATH 2410. Methods of Linear Algebra.** [Formerly MATH 194] Vectors and matrix operations. Linear transformations and fundamental properties of finite dimensional vector spaces. Solutions of systems of linear equations. Eigenvalues and eigenvectors. No credit for students who have earned credit for 2400, 2501, or 2600. Students who have earned credit for 2500 will earn only two credits for this course. Prerequisite or corequisite: 2300. [3] (MNS)

**MATH 2420. Methods of Ordinary Differential Equations.** [Formerly MATH 198] Linear first-order differential equations, applications, higher order linear differential equations, complementary and particular solutions, applications, Laplace transform methods, series solutions, numerical techniques. No credit for students who have earned credit for 2400 or 2610. Prerequisite: 2300 or 2501. [3] (MNS)

**MATH 2500. Multivariable Calculus and Linear Algebra.** [Formerly MATH 205A] Vector algebra and geometry; linear transformations and matrix algebra. Real and complex vector spaces, systems of linear equations, inner product spaces. Functions of several variables and vector-valued functions: limits, continuity, the derivative. Extremum and nonlinear problems, manifolds. Multiple integrals, line and surface integrals, differential forms, integration on manifolds, theorems of Green, Gauss, and Stokes. Eigenvectors and eigenvalues. Emphasis on rigorous proofs. No credit for students who have earned credit for 2501, 2300, 2410, or 2600. Open only to first-year students with a test score of 5 on the Calculus-BC Advanced Placement examination. [4] (MNS)

**MATH 2501. Multivariable Calculus and Linear Algebra.** [Formerly MATH 205B] Continuation of 2500. Vector algebra and geometry; linear transformations and matrix algebra. Real and complex vector spaces, systems of linear equations, inner product spaces. Functions of several variables and vector-valued functions: limits, continuity, the derivative. Extremum and nonlinear problems, manifolds. Multiple integrals, line and surface integrals, differential forms, integration on manifolds, theorems of Green, Gauss, and Stokes. Eigenvectors and eigenvalues. Emphasis on rigorous proofs. No credit for students who have earned credit for 2300, 2410, or 2600. Prerequisite: 2500 and first-year standing. [4] (MNS)

**MATH 2600. Linear Algebra.** [Formerly MATH 204] Algebra of matrices, real and complex vector spaces, linear transformations, and systems of linear equations. Eigenvalues, eigenvectors, inner product spaces, and orthonormal bases. Designed primarily for mathematics majors. No credit for students who have earned credit for 2410 or 2501. Students who have earned credit for 2500 will earn only two credits for this course. Prerequisite or corequisite: 2300. [3] (MNS)

**MATH 2610. Ordinary Differential Equations.** [Formerly MATH 208] First- and second-order differential equations, applications. Matrix methods for linear systems; stability theory of autonomous systems; existence

and uniqueness theory. Intended for mathematics and advanced science majors. No credit for students who have earned credit for 2400 or 2420. Prerequisite: concurrent enrollment in 2501 or prior credit for either 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 2810. Probability and Statistics for Engineering.** [Formerly MATH 216] Discrete and continuous probability functions, cumulative distributions. Normal distribution. Poisson distribution and Poisson process. Conditional probability and Bayes' formula. Point estimation and interval estimation. Hypothesis testing. Covariance and correlation. Linear regression theory and the principle of least squares. Monte Carlo methods. Intended for students in Electrical Engineering and Computer Engineering. No credit for students who have earned credit for 2820. Prerequisite: 2300 or 2501. [3] (No AXLE credit)

**MATH 2820. Introduction to Probability and Mathematical Statistics.** [Formerly MATH 218] Discrete and continuous probability models, mathematical expectation, and joint densities. Laws of large numbers, point estimation, and confidence intervals. Hypothesis testing and applications. Students taking 2820 are encouraged to take 2820L concurrently. No credit for students who have earned credit for 2810. Prerequisite: 2300 or 2501. [3] (MNS)

**MATH 2820L. Statistics Laboratory.** [Formerly MATH 218L] Applications of the theory developed in 2820. Emphasis on data analysis and interpretation. Topics include the one- and two-sample problems, paired data, correlation and regression, chi-square, and model building. Pre- or corequisite: 2810 or 2820. [1] (No AXLE credit)

**MATH 2821. Introduction to Applied Statistics.** [Formerly MATH 219] Review of basic applied statistics. Analysis of variance as a technique for interpreting experimental data. Generalized likelihood ratio principle, confounding, multiple comparisons, introduction to response surface methodology, and nonparametric methods. Experimental designs: completely randomized, nested, orthogonal contrasts, randomized block, Latin squares, factorial, and fractional factorial. Prerequisite: 2810 or 2820. [3] (MNS)

**MATH 3000. History of Mathematics.** [Formerly MATH 252] Major developments in mathematics from ancient times to the early twentieth century. Emphasis both on the historical perspective and the mathematics; assignments include many exercises and theorems. Highly recommended for teacher candidates. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 3010. Intensive Problem Solving and Exposition.** [Formerly MATH 200] Intended to develop widely-applicable mathematical skills. Basic principles such as induction, the pigeonhole principle, symmetry, parity, and generating functions. Prerequisite: 2300 or 2500. [3] (MNS)

**MATH 3100. Introduction to Analysis.** [Formerly MATH 260] Properties of real numbers, compactness and completeness. Limits, sequences and series, uniform convergence, and power series. Basic properties of functions on the real line, and the elementary theory of differentiation and integration. Emphasis on methods of proof used in advanced mathematics courses. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 3110. Complex Variables.** [Formerly MATH 261] Complex numbers, analytic and elementary functions, transformations of regions. Complex integrals, Cauchy's integral theorem and formula, Taylor and Laurent series. The calculus of residues with applications, conformal mappings. Prerequisite: 2300 or 2501. [3] (MNS)

**MATH 3120. Introduction to Partial Differential Equations.** [Formerly MATH 234] Initial- and boundary-value problems for partial differential equations using separation of variables in conjunction with Fourier series and integrals. Explicit solutions of problems involving the heat equation, the wave equation, and Laplace's equation. Prerequisite: Either 2410, 2600, or 2501 and either 2400, 2420, or 2610. [3] (MNS)

**MATH 3130. Fourier Analysis.** [Formerly MATH 263] Fourier series topics including convolution, Poisson kernels, Dirichlet kernels, and pointwise and mean-square convergence. Integral transforms including one-dimensional and multidimensional Fourier integrals, Fourier inversion formula and Plancherel theorem, Poisson summation formula, Radon transform, and X-ray transform. Fourier analysis on Abelian groups including finite Fourier analysis and fast Fourier transform. Applications to signal processing,

Shannon sampling theory, and/or compressed sensing. Repeat credit for students who completed 267 section 1 in spring 2011 or spring 2013. Prerequisite: Either 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 3165. Advanced Calculus.** [Formerly MATH 259] Advanced treatment of multivariable calculus. Differentiation of functions of several variables, including inverse and implicit function theorems. Vector differential calculus. Integration of functions of several variables. Vector integral calculus, including Stokes' theorem. No credit for students who have earned credit for 3600. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 3200. Introduction to Topology.** [Formerly MATH 242] Open sets, closed sets, continuity, compactness, and connectivity. Subspaces, product spaces, and quotient spaces. Knot theory, topology of surfaces, and applications. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3210. Transformation Geometry.** [Formerly MATH 240] Transformations of the plane, groups of transformations, reflections, glide reflections, classification of the isometries of the plane, frieze groups, analysis of frieze patterns, wall paper groups, and analysis of wall paper patterns. Especially recommended for prospective teachers of mathematics. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3230. Introduction to Differential Geometry.** Smooth maps, tangent space, and surfaces and hypersurfaces in  $n$ -dimensional Euclidean space. Inverse and Implicit Function theorems. Sard's theorem. Transversality. Degree of a map; intersection theory modulo 2. Orientability and oriented intersection number. No credit for students who have earned credit for 4220. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 3300. Abstract Algebra.** [Formerly MATH 223] Fundamental properties of integers and polynomials. Elementary properties of groups, rings, integral domains, fields, and lattices. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3310. Introduction to Mathematical Logic.** [Formerly MATH 250] Development of the first order predicate calculus and fundamental metamathematical notions. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3320. Error-Correcting Codes and Cryptography.** [Formerly MATH 253] Applications of algebra to reliability and secrecy of information transmission. Error-correcting codes, including linear, Hamming, and cyclic codes, and possibly BCH or Reed-Solomon codes. Cryptography, including symmetric-key, DES and RSA encryption. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3600. Advanced Engineering Mathematics.** [Formerly MATH 229] Vector analysis including directional derivatives, transformation of coordinates, divergence and curl. Line integrals, surface integrals, and divergence theorem. Stokes' theorem. Functions of a complex variable, including limits, derivatives, and Cauchy-Riemann equations. Exponential, trigonometric, hyperbolic, and logarithmic functions. Complex integrals, Cauchy's integral theorem and formula. Taylor and Laurent series. Calculus of residues. No credit for students who have earned credit for 3165. Prerequisite: 2400, 2420, or 2610. [3] (MNS)

**MATH 3620. Introduction to Numerical Mathematics.** [Formerly MATH 226] Numerical solution of linear and nonlinear equations, interpolation and polynomial approximation, non-numerical differentiation and integration. Least-squares curve fitting and approximation theory, numerical solution of differential equations, errors and floating point arithmetic. Application of the theory to problems in science, engineering, and economics. Student use of the computer is emphasized. Familiarity with computer programming is expected. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

**MATH 3630. Mathematical Modeling in Biology and Medicine.** [Formerly MATH 262] Basic mathematical modeling tools, such as interpolation, least-squares regression, difference equations, and ordinary and partial differential equations. Statistical analysis of data, support vector machines, and computer simulation. Familiarity with computer programming is expected. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

**MATH 3640. Probability.** [Formerly MATH 247] Combinatorics, probability models (binomial, Poisson, normal, gamma, etc.) Stochastic independence, generating functions, limit theorems and types of convergence, bivariate distributions, transformations of variables. Markov processes, applications. Except for students with extremely strong backgrounds, 2820 should be taken prior to 3640. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 3641. Mathematical Statistics.** [Formerly MATH 248] Distribution theory, order statistics, theory of point estimation and hypothesis testing, normal univariate inference, Bayesian methods, sequential procedures, regression, nonparametric methods. Students interested in applications may take 2820L. Prerequisite: 3640. [3] (MNS)

**MATH 3650. Introduction to Actuarial Mathematics.** [Formerly MATH 246A] Applications of calculus and probability to actuarial science. The foundations of financial mathematics, including the theory of interest. Prerequisite: 2300 or 2501. Prerequisite or corequisite: 2810, 2820, or 3640. [3] (MNS)

**MATH 3651. Actuarial Models.** [Formerly MATH 246B] Probabilistic analysis of insurance. Single-life models, including time-value of benefits, life annuities, premiums, and benefit reserves: Multiple-decrement models; Multiple-life models. Probabilistic topics: Markov chains and Poisson processes. Prerequisite: 3650 and either 2810, 2820 or 3640. [3] (MNS)

**MATH 3660. Mathematical Modeling in Economics.** [Formerly MATH 256] Modeling microeconomic problems of supply and demand, profit maximization, and Nash equilibrium pricing. Auctions and bargaining models. Statistical models and data analysis. Computational experiments. Prerequisite: 2300 or 2501. [3] (MNS)

**MATH 3700. Discrete Mathematics.** [Formerly MATH 215] Elementary combinatorics including permutations and combinations, the principle of inclusion and exclusion, and recurrence relations. Graph theory including Eulerian and Hamiltonian graphs, trees, planarity, coloring, connectivity, network flows, some algorithms and their complexity. Selected topics from computer science and operations research. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3800. Theory of Numbers.** [Formerly MATH 221] Factorization of integers, Fundamental Theorem of Arithmetic, congruences, Wilson's theorem. Fermat's theorem, arithmetic functions, perfect numbers, Law of Quadratic Reciprocity. Diophantine equations, Pythagorean triples, sums of squares. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 3859. Independent Study.** [Formerly MATH 298] Reading and independent study in mathematics under the supervision of an adviser. Designed primarily for honors candidates, but open to others with approval by department chair. [Variable credit: 1-3 each semester, not to exceed 6 without departmental permission] (No AXLE credit)

**MATH 3890. Selected Topics for Undergraduates.** [Formerly MATH 267] Topics vary. May be repeated for a total of 12 credits in 3890 and 3895 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [1-3; maximum of 12 credits total for all semesters of MATH 3890 and 3895 combined] (No AXLE credit)

**MATH 4110. Partial Differential Equations.** [Formerly MATH 294] Classification of equations: equations of elliptic, parabolic, and hyperbolic type. Separation of variables, orthonormal series, solutions of homogeneous and nonhomogeneous boundary value problems in one-, two-, and three-dimensional space. Possible additional topics include subharmonic functions and the Perron existence theorem for the Laplace equation of Sturm-Liouville theory. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

**MATH 4200. Topology.** [Formerly MATH 272A] Connectedness, compactness, countability, and separation axioms. Complete metric spaces. Function spaces. Prerequisite: 2501, 3200, or 4220. [3] (MNS)

**MATH 4201. Topology.** [Formerly MATH 272B] The fundamental group and covering spaces. Topology of surfaces. Simplicial complexes and homology theory. Homotopy theory. Prerequisite: 4200. [3] (MNS)



**MATH 4220. Differentiable Manifolds.** [Formerly MATH 243] Manifolds in  $n$ -dimensional Euclidean space, smooth maps; inverse and implicit function theorems. Regular value theorem, immersions and submersions, Sard's theorem, and transversality. Degree of a map; winding numbers and the Fundamental Theorem of Algebra; intersection theory modulo 2. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 4300. Modern Algebra.** [Formerly MATH 283A] Group theory through Sylow theorems and fundamental theorem of finitely generated abelian groups. Prerequisite: 3300. [3] (MNS)

**MATH 4301. Modern Algebra.** [Formerly MATH 283B] Introductory theory of commutative rings and fields, and additional topics such as Galois theory, modules over a principal ideal domain and finite dimensional algebras. Prerequisite: 4300. [3] (MNS)

**MATH 4310. Set Theory.** [Formerly MATH 280] The basic operations on sets. Cardinal and ordinal numbers. The axiom of choice. Zorn's lemma, and the well-ordering principle. Introduction to the topology of metric spaces, including the concepts of continuity, compactness, connectivity, completeness, and separability. Product spaces. Applications to Euclidean spaces. Strongly recommended for beginning graduate students and for undergraduates who plan to do graduate work in mathematics. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 4320. Lattice Theory and the Theory of Ordered Sets.** [Formerly MATH 284] An introduction to basic concepts and theorems in lattice theory and the theory of ordered sets with connections to universal algebra and computer science. Boolean algebras, modular and distributive lattices, ordered topological spaces, algebraic lattices and domains, fixed point theorems, cosets, free lattices. Prerequisite: 3300. [3] (MNS)

**MATH 4600. Numerical Analysis.** [Formerly MATH 286] Finite difference and variational methods for elliptic boundary value problems, finite difference methods for parabolic and hyperbolic partial differential equations, and the matrix eigenvalue problem. Student use of the computer is emphasized. Prerequisite: 3620. [3] (MNS)

**MATH 4610. Methods of Mathematical Physics.** [Formerly MATH 292] Linear operators on vector spaces, matrix theory, and Hilbert spaces. Functions of a complex variable and calculus of residues. Ordinary and partial differential equations of mathematical physics, boundary value problems, special functions. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

**MATH 4620. Linear Optimization.** [Formerly MATH 288] An introduction to linear programming and its applications. Formulation of linear programs. The simplex method, duality, complementary slackness, dual simplex method and sensitivity analysis. The ellipsoid method. Interior point methods. Possible additional topics include the primal-dual algorithm, cutting planes, or branch-and-bound. Applications to networks, management, engineering, and physical sciences. Prerequisite: either 2410, 2600, or 2501, and either CS 1101 or 1103. [3] (MNS)

**MATH 4630. Nonlinear Optimization.** [Formerly MATH 287] Mathematical modeling of optimization problems. Theory of unconstrained and constrained optimization, including convexity and the Karush-Kuhn-Tucker conditions. Derivative- and non-derivative-based methods. Familiarity with computer programming is expected. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

**MATH 4650. Financial Stochastic Processes.** [Formerly MATH 249A] The theory of stochastic processes and applications to financial economics. Brownian motion; martingales; Itô's Lemma; stochastic integration. Monte Carlo simulations with variance reduction techniques. Applications include discretetime option pricing and delta hedging. Prerequisite: 3650 and either 2810, 2820, or 3640. [3] (MNS)

**MATH 4651. Evaluation of Actuarial Models.** [Formerly MATH 249B] Applications of statistics to the evaluation and selection of actuarial models. Severity, frequency, and aggregate models. Measure of risk. Applications of Bayesian analysis to credibility theory. Simulation and bootstrap methods. Prerequisite: 3651, 3641, and 4650. [3] (MNS)

**MATH 4700. Combinatorics.** [Formerly MATH 274] Elements of enumerative analysis including permutations, combinations, generating functions,

recurrence relations, the principle of inclusion and exclusion, and Polya's theorem. Some special topics will be treated as class interest and background indicate (e.g., Galois fields, theory of codes, and block designs). Students unfamiliar with permutations, combinations, and basic counting techniques should take 3700 prior to 4700. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

**MATH 4710. Graph Theory.** [Formerly MATH 275] The mathematical theory of networks. Traversing graphs using paths, cycles, and trails. Matchings and other graph factors. Coloring of vertices and edges. Connectivity and its relation to paths and flows. Embeddings of graphs in surfaces, especially the plane. Prerequisite: linear algebra. Students unfamiliar with basic ideas of graph theory, including paths, cycles, and trees, should take 3700 prior to 4710. [3] (MNS)

**MATH 4999. Senior Thesis.** [Formerly MATH 269] A written presentation of research results, original for the student but not usually original in the larger sense. The regulations governing the writing of a master of arts thesis in mathematics will apply to the writing of the senior thesis. [3] (No AXLE credit)

## Medicine, Health, and Society

**MHS 1001. Commons Seminar.** [Formerly MHS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**MHS 1111. First-Year Writing Seminar.** [Formerly MHS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**MHS 1920. Politics of Health.** [Formerly MHS 170] Sociocultural analysis of the conflicts, definitions, inequalities, and structures of power that influence health. [3] (P)

**MHS 1930. Social Dimensions of Health and Illness.** [Formerly MHS 201] Multidisciplinary introduction to health conditions from perspectives of anthropology, economics, history, political science and policy studies, philosophy, religious studies, and sociology. Guest lectures by representatives of various disciplines. [3] (P)

**MHS 1940. Racial and Ethnic Health Disparities.** [Formerly MHS 180] Relationship between health outcomes and race and ethnicity. Historical and contemporary factors influencing differences in health outcomes, including mental health, HIV/AIDS, and other chronic diseases. Explanations of health disparities and of strategies to reduce them. [3] (SBS)

**MHS 1950. Disabled Bodies, Cyborg Cultures.** Historical and cultural evolution of disability and assistive technologies, including prosthetics and artificial limbs. Shifts in social views resulting from disability communities, war, economics, and design. No credit for students who have earned credit for 290-02 in fall 2013. [3] (HCA)

**MHS 2110. American Medicine and the World.** [Formerly MHS 208] Social foundations of medical authority. Health disparities in the United States and abroad. Effects of social settings of medical research, evaluation, and treatment on health outcomes. Inequalities in medical knowledge and institutions. No credit for students who earned credit for 290 section 3 in fall 2012. [3] (P)

**MHS 2120. Health Social Movements.** [Formerly MHS 210] Health inequality and inequity based on race, ethnicity, gender, class, and sexuality. Issues related to access to health care services. Crusades for certain diseases, illness experiences, and disabilities. Challenging science on etiology, diagnosis, treatment, and prevention. No credit for students who earned credit for 290 section 1 in fall 2012. [3] (P)

**MHS 2130. Social Movements and Community Action.** [Formerly MHS 211] The literature of social activism. How citizens individually and collectively accomplish and resist social change. Historical and contemporary health movements as case studies to illustrate the advantages and limitations of social change strategies. [3] (SBS)

**MHS 2150. Medical Humanities.** [Formerly MHS 248] Conceptual and creative analysis of philosophy, literature, art, and music to identify and account for human nature in the medical context. Ethical, practical, and social management of medical technology. Theories of art, music, and literature to understand human creativity and self-explanation in the face of illness and difference. Serves as repeat credit for students who completed 295 section 2 in either spring 2010 or spring 2009. [3] (HCA)

**MHS 2230. Masculinity and Men's Health.** [Formerly MHS 232] Interdisciplinary approach to men's health issues and to perceptions of masculinity. The history of men's diseases. Men in clinical settings. Social policies that affect men's health behaviors. No credit for students who earned credit for 290 section 5 in fall 2012. [3] (P)

**MHS 2240. Bionic Bodies, Disability Cultures.** [Formerly MHS 242] Historical and cultural evolution of prosthetics, artificial limbs, and other assistive technologies. Shifts in social views resulting from war, economics, and art and design. [3] (HCA)

**MHS 2250. War and the Body.** [Formerly MHS 212] Impact of war on the human body. Anthropology of the body and theories of bodily experience. Production, representation, and experience of war and of military and medical technologies on a bodily level. Acceptable and unacceptable types of harm. No credit for students who earned credit for 290 section 2 in fall 2012. [3] (P)

**MHS 2310. Chinese Society and Medicine.** [Formerly MHS 231] Medicine and health in contemporary China. Social organization of medical care, social determinants of health and disease, social construction of health and disease, and health-related social problems. Serves as repeat credit for students who completed 290 section 3 in fall 2010 and section 1 in fall 2011. [3] (SBS)

**MHS 2320. Medicine, Law, and Society.** [Formerly MHS 244] Survey of issues in medicine and law, including the physician-patient relationship, medical malpractice, organ donation, healthcare financing, and the limits and powers of the government to protect the public's health. Serves as repeat credit for students who completed 290 section 3 in fall 2010, 290 section 2 in spring 2010, or 290 section 2 in spring 2009. [3] (SBS)

**MHS 2330. Men's Health Research & Policy.** [Formerly MHS 234] Concepts and theories of men's health. Global and domestic issues. Effect of men's social and economic advantages on health outcomes. Strategies to improve men's health; relationships between cultural values and health policy; and cultural explanations that shape men's health campaigns. No credit for students who earned credit for 290 section 14 in spring 2013. [3] (SBS)

**MHS 2350. Italian Representations of Wellness and Illness.** From 1300 to the present. Depictions of health and sickness in Italian literature, art, and film. Historical, cultural, and social dimensions of health in Italy and changes in the societal approach to health. Italian society's views on health, wellness, and the stigmatization of physical and mental illness. [3] (INT)

**MHS 2410. HIV/AIDS in the Global Community.** [Formerly MHS 236] Medical, social, political, economic, and public policy dimensions of HIV/AIDS. Prevention and treatment strategies, social stigma, and discrimination. Repeat credit for students who completed 290 section 2 in fall 2009 and for students who completed 290 section 5 in fall 2008. [3] (P)

**MHS 2420. Economic Demography and Global Health.** [Formerly MHS 206] Economic consequences of demographic change in developing and developed countries. Links between socioeconomic status and health; relationship between health and economic growth; determinants of fertility, mortality, and migration. [3] (SBS)

**MHS 2430. Social Capital and Health.** [Formerly MHS 240] Theoretical approaches to social capital and their applications to the social production of disease and illness. Theoretical background of social capital; the conceptualization and measurement of social capital; and the multiple roles of social capital as a social antecedent of health. Serves as repeat credit for students who completed 290 section 5 in spring 2010 and section 1 in spring 2011. [3] (SBS)

**MHS 2510. Caring for Vulnerable Populations.** [Formerly MHS 237] Humanitarian aid and the risks and responsibilities in providing for vulner-

able populations. Differences between acute and chronic crises. Geopolitical, cultural, clinical, and practical factors. Serves as repeat credit for students who completed 290 section 3 in spring 2010 and for students who completed 290 section 4 in either spring 2009 or spring 2008. [3] (No AXLE credit)

**MHS 2520. Autism in Context.** [Formerly MHS 250] Multiple manifestations. Impact, questions, and debates. Familial, educational, sociological, legal, and medical contexts. [3] (SBS)

**MHS 2610. Global Health Crises.** Development of global health priorities, responses to emerging crises, and unintended consequences of global health interventions. No credit for students who have earned credit for 3890-01 offered fall 2015 or 3890-02 offered spring 2016. [3] (INT)

**MHS 2950. Healing Animals.** Animals as subjects of medical research and as patients in veterinary medicine. Health of animals as friends, food, entertainment, and vectors of disease. Celebration and concealment of the centrality of animals in modern medicine through legal, economic, social, and emotional techniques. No credit for students who earned credit for 290-03 offered spring 2015. [3] (P)

**MHS 3000. Undergraduate Seminar.** [Formerly MHS 295] Advanced reading, research, and writing. Topics vary. Limited to juniors and seniors with preference to majors in Medicine, Health, and Society. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Offered on a graded basis only. [3; maximum of 6 credits total for all semesters of MHS 3000] (No AXLE credit)

**MHS 3010. Global Health Principles and Practice.** Introduction to major global health principles and practices in the developing and developed world. Perspectives of public health practitioners and critical thinking about global health challenges and solutions. [3] (P)

**MHS 3020. U.S. Public Health Ethics and Policy.** [Formerly MHS 203] Critical perspectives on ethical and policy issues in U.S. public health. [3] (P)

**MHS 3030. Community Health Research.** [Formerly MHS 235] Conceptual and methodological challenges. Focus on descriptive studies and intervention research to address health disparities in chronic diseases and psychiatric disorders. [3] (SBS)

**MHS 3040. Designing Healthy Publics.** Politics of public health and the built environment in U.S. cities from the nineteenth century to the present. Critical perspectives on health promotion, research, and design. Nashville as a case study. No credit for students who earned credit for 248 in fall 2014. [3] (US)

**MHS 3050W. Medicine and Literature.** [Formerly MHS 205W] Narrative analysis, and other humanistic, interpretative practices of relevance to medicine and health. [3] (HCA)

**MHS 3110. Global Health and Social Justice.** [Formerly MHS 204] Global health institutions, policies, and practices. Issues of social justice. Anthropological, sociological, and scientific studies that address the social, moral, political and economic factors influencing the definition of and response to global health problems. No credit for students who earned credit for 290 section 4 in fall 2012. [3] (P)

**MHS 3120. Medicine, Technology, and Society.** [Formerly MHS 245] Tensions between art and science in medicine. The effect of science and technology on the doctor-patient relationship. Social and ethical issues raised by new biomedical developments. Repeat credit for students who completed 295 section 1 in fall 2009. [3] (No AXLE credit)

**MHS 3140. Afrofuturism and Cultural Criticisms of Medicine.** [Formerly MHS 216] Exploration of Afrofuturism as a literary genre and its critique of the impact of techno-science and medicine on black health, life, and futurity. Multidisciplinary approach in understanding novels, memoirs, and secondary texts. No credit for students who earned credit for 290 section 3 in fall 2013. [3] (HCA)

**MHS 3150. Death and Dying in America.** [Formerly MHS 225] Interdisciplinary introduction to thanatology; changes in medicine and attitudes towards dying as they reshape the American way of death in a multicultural landscape. [3] (P)

**MHS 3210. Health, Development, and Culture in Guatemala.** [Formerly MHS 281A] Social dimensions of health in Guatemalan communities. History, culture, and political economy. Spanish language skills strongly recommended. No credit for students who earned credit for INDS 270a section 3 in spring 2010 or 218 in spring 2014. Instructor consent required. [3] (INT)

**MHS 3212. Health, Development, and Culture in Guatemala.** [Formerly MHS 218B] Social and political dimensions of health and development in Guatemala through fieldwork and service learning in rural Maya communities in Quetzaltenango and Sololá. Prerequisite: 3210. [1-3] (No AXLE credit)

**MHS 3220. Healthcare Organizations.** [Formerly MHS 222] Key healthcare organizations in the context of policies governing the U.S. healthcare system. How organizations and policies shape the meaning of health and the dynamics of medical encounters. No credit for students who have earned credit for 295 in spring 2012. [3] (SBS)

**MHS 3250. Perspectives on Trauma.** [Formerly MHS 254] Trauma as a framework for understanding individual and collective suffering. Trauma in the context of medicine, war, and politics, and of racial, sexual, and gender inequalities. Alternative ways of conceptualizing feeling, memory and loss. No credit for students who earned credit for 295 section 02 in spring 2013. [3] (SBS)

**MHS 3310. Health Care in France and the U.S.** [Formerly MHS 256] Comparison of contemporary health care systems and the evolution of medicine and health policies in France and the United States. Includes travel to France to visit health care delivery centers and meet with health professionals. Knowledge of French is not required. No credit for students who have earned credit for 290 section 1 in summer 2014. [3] (INT)

**MHS 3320. Introduction to U.S. Health Care Policy.** Key features of U.S. health care system. Financing and delivery; historical trends; and comparisons to other countries. Methods of health policy evaluation. [3] (SBS)

**MHS 3350. Medicine, Religion, and Spirituality.** [Formerly MHS 246] How individuals, families, and communities deal with such life events as birth, serious illness and injury, disability, war, and death through the combined belief in medicine and religion. Sources include fiction, poetry, drama, film, and texts. Research seminar. Serves as repeat credit for students who completed 295 section 2 in either fall 2009 or fall 2008. [3] (No AXLE credit)

**MHS 3830. Service Learning.** [Formerly MHS 294A] Under faculty supervision, students will design a program of community service associated with a set of learning objectives. The service component (3830) should benefit both the recipient and the provider of the service, offering the latter opportunities for self-reflection, self-discovery, and the development of values, skills, and knowledge. A central objective must be firsthand experience of a central issue or issues studied in sociology, psychology, political science, economics, or another academic discipline. The MHS program will work to find placements for interested students. The other component, 3831, will consist of an independent study in the relevant discipline and must be closely linked to the issue(s) addressed in 3830. For example, a student may provide services to the elderly in nursing homes and use 3831 to study how state and federal policies affect the delivery of health care and other services to nursing home populations. To be accepted, students must have a 2.90 overall grade point average and 6 hours of prior work in approved MHS courses. They must submit a specific plan for the service-learning experience to the MHS program director. Must be taken Pass/Fail and concurrently with 3831. These hours shall not be included in the minimum hours required for the MHS major or minor. After completing the experience, all students must write a thorough report. Corequisite: 3831. [1-3] (No AXLE credit)

**MHS 3831. Service Learning Research and Readings.** [Formerly MHS 294B] Under faculty supervision, students will design a program of community service associated with a set of learning objectives. The service component (3830) should benefit both the recipient and the provider of the service, offering the latter opportunities for self-reflection, self-discovery, and the development of values, skills, and knowledge. A central objective must be firsthand experience of a central issue or issues studied in

sociology, psychology, political science, economics, or another academic discipline. The MHS program will work to find placements for interested students. The other component – 3831 – will consist of an independent study in the relevant discipline and must be closely linked to the issue(s) addressed in 3830. For example, a student may provide services to the elderly in nursing homes and use 3831 to study how state and federal policies affect the delivery of health care and other services to nursing home populations. To be accepted, students must have a 2.90 overall grade point average and 6 hours of prior work in approved MHS courses. They must submit a specific plan for the service-learning experience to the MHS program director. Students will write a substantial research or interpretative paper under the supervision of a Vanderbilt faculty member on a topic related to their service learning experience. Corequisite: 3830. [1-3] (No AXLE credit)

**MHS 3850. Independent Study.** [Formerly MHS 296] A program of reading and/or research in one area of MHS studies to be selected in consultation with an adviser. Normally limited to qualified MHS minors or majors. Approval of faculty adviser and MHS program director required for enrollment. May be repeated for credit once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. (However, students in the MHS honors program may count a total of 12 hours in MHS 3850, including the 6 hours in the senior year devoted to preparation of the honors thesis. The same instructor will ordinarily supervise work on the honors thesis in both fall and spring semesters; a student may work with a thesis adviser who has previously supervised an independent study with that student.) [1-3; maximum of 6 credits for all semesters of MHS 3850; maximum of 12 credits for students in the MHS honors program] (No AXLE credit)

**MHS 3880. Internship Training.** [Formerly MHS 293A] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs devoted to health care, public health, health-related policy and research. Two options are available. (1) Full-time: 12-15 hours total, including 6-9 hours in 3880, and 6 hours in 3881. (2) Part-time: 2-9 hours total, including 1-6 hours in 3880 and 1-3 hours in 3881. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in approved MHS courses; they must submit a specific plan for the internship to the MHS program director. After completing the internship, all students must write a thorough report. Note: All work for an internship must be completed during a single semester or summer. Must be taken Pass/Fail and concurrently with 3881. These hours shall not be included in the minimum hours required for the MHS major or minor. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

**MHS 3881. Internship Readings and Research.** [Formerly MHS 293B] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs devoted to health care, public health, health-related policy and research. Two options are available. (1) Full-time: 12-15 hours total, including 6-9 hours in 3880, and 6 hours in 3881. (2) Part-time: 2-9 hours total, including 1-6 hours in 3880 and 1-3 hours in 3881. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in approved MHS courses; they must submit a specific plan for the internship to the MHS program director. After completing the internship, all students must write a thorough report. Note: All work for an internship must be completed during a single semester or summer. Students will write a substantial research or interpretative paper under the supervision of a regular Vanderbilt faculty member. Corequisite: 3880. [Variable credit: 1-6] (No AXLE credit)

**MHS 3890. Special Topics.** [Formerly MHS 290] May be repeated for credit twice if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3; maximum of 9 credits total for all semesters of MHS 3890] (No AXLE credit)

**MHS 4010. Psychiatry, Culture, and Globalization.** [Formerly MHS 252] Cross-cultural analysis of mental illness; the emergence of cultural psychiatry; and the globalization of biopsychiatry and neuroscience. No credit for students who earned credit for 295 section 2 in fall 2012. [3] (P)

**MHS 4050. Narrative and Medicine: Stories of Illness and the Doctor-Patient Relationship.** [Formerly MHS 220] Use of classical and contemporary illness narratives to understand the doctor-patient relationship. Focus on patient stories in clinical settings. [3] (HCA)

**MHS 4998. Honors Research.** [Formerly MHS 297] Offered on a graded basis only. Limited to seniors admitted to the departmental honors program. [3] (No AXLE credit)

**MHS 4999. Honors Thesis.** [Formerly MHS 298] Offered on a graded basis only. Limited to seniors admitted to the departmental honors program. [3] (No AXLE credit)

## Military Science

**MS 1510. American Military History: Principles of War.** [Formerly MS 151] Offered on a pass/fail basis only. [3]

## Naval Science

**NS 1100. Introduction to Naval Science (Navy and Marine option).** [Formerly NS 100] No Credit Toward Current Degree. [3]

**NS 1300. Naval Operations (Navy option).** [Formerly NS 130] No Credit Toward Current Degree. [3]

**NS 2410. Organization and Management (Navy & Marine option).** [Formerly NS 241] [3]

**NS 2420. Leadership and Ethics (Navy & Marine option).** [Formerly NS 242] No Credit Toward Current Degree. [3]

## Neuroscience

**NSC 1001. Commons Seminar.** [Formerly NSC 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**NSC 2060. Elective (Cellular and Molecular).** [Formerly 71AT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Cellular and Molecular elective.

**NSC 2065. Elective (Systems and Integrative).** [Formerly 72AT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Systems and Integrative elective.

**NSC 2201. Neuroscience.** [Formerly NSC 201] Physiology of nerve cells, sensory and motor systems, sleep, speech, and sexual behavior. Clinical topics include the chemical basis of psychosis, diseases of the brain, and repair mechanisms after brain injury. [3] (MNS)

**NSC 3235. Biological Basis of Mental Disorders.** [Formerly NSC 235] Cellular and molecular neuropathology of cortical dysfunction resulting from affective disorders, drug addiction, neurodegenerative disease, and stroke. Prerequisite: 2201. [3] (MNS)

**NSC 3240. Neurobiology of Addiction.** Neural basis of the regulation and dysregulation of reward processing. Pathophysiology of addiction. No credit for students who have earned credit for 3891 section 01 offered spring 2016. Prerequisite 2201. [3] (MNS)

**NSC 3260. Psychopharmacology.** [Formerly NSC 260] Actions of therapeutic drugs for psychiatric disorders and of drugs of abuse. Molecular mechanisms of effects on perception, cognition, and emotion. Prerequisite: 2201. [3] (MNS)

**NSC 3269. Developmental Neuroscience.** [Formerly NSC 269] Normal and abnormal brain development. Cell division, migration, and death; synapse formation and plasticity; and clinical syndromes. Prerequisite: 2201. [3] (MNS)

**NSC 3270. Computational Neuroscience.** [Formerly NSC 270] Theoretical, mathematical, and simulation models of neurons, neural networks, or brain systems. Computational approaches to analyzing and understanding data such as neurophysiological, electrophysiological, or brain

imaging. Demonstrations simulating neural models. Prerequisite: 2201, either CS 1101 or 1103, and either MATH 1200 or 1300. [3] (MNS)

**NSC 3272. Structure and Function of the Cerebral Cortex.** [Formerly NSC 272] Classic and current concepts of cerebral function. Species differences, receptive field organization, neurotransmitters, modifications by experience, and behavioral effects. Prerequisite: 2201. [3] (MNS)

**NSC 3274. Neuroanatomy.** [Formerly NSC 274] Gross structure, histological architecture, and techniques for creating images of the human brain. [3] (MNS)

**NSC 3851. Independent Reading in Neuroscience.** [Formerly NSC 291] Reading and discussion of research papers on a selected topic under direction of a faculty sponsor. Consent of both faculty sponsor and the director of honors and independent study is required. May be repeated for credit once if there is no duplication in topic, but students may earn only up to 1 credit per semester of enrollment. [1; maximum of 2 credits for all semesters of NSC 3851] (No AXLE credit)

**NSC 3860. Introduction to Neuroscience Research.** [Formerly NSC 190] Research and reading in the laboratory of a member of the Neuroscience Program. Consent of the Director of Honors and Independent Research is required. Serves as repeat credit for students who have completed 290. [1] (No AXLE credit)

**NSC 3861. Undergraduate Research.** [Formerly NSC 292A] Original student research on a defined problem in neuroscience under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of honors and independent studies is required. Prerequisite: 3860 or both 2201 and sophomore standing. [2] (No AXLE credit)

**NSC 3862. Undergraduate Research.** [Formerly NSC 292B] Continuation of 3861. Original student research on a defined problem in neuroscience under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of honors and independent studies is required. Prerequisite: 3861. [2] (No AXLE credit)

**NSC 3863. Advanced Research in Neuroscience.** [Formerly NSC 293A] Original student research on a defined problem in neuroscience under the direction of a faculty sponsor with some independence in the design and execution of the project. Consent of both the faculty sponsor and the director of honors and independent studies is required. Prerequisite: 3862. [3] (No AXLE credit)

**NSC 3864. Advanced Research in Neuroscience.** [Formerly NSC 293B] Continuation of a research project on a defined problem in neuroscience under the direction of a faculty sponsor with some independence in the design and execution of the project. Consent of both the faculty sponsor and the director of honors and independent studies is required. May be taken for credit more than once, but students may earn only up to 3 credits per semester. Prerequisite 3863. [3] (No AXLE credit)

**NSC 3891. Special Topics in Cellular and Molecular Neuroscience.** [Formerly NSC 285] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2201. [3] (MNS)

**NSC 3892. Special Topics in Systems and Integrative Neuroscience.** [Formerly NSC 287] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2201. [3] (MNS)

**NSC 4961. Integrative Neuroscience.** [Formerly NSC 255] Structure and function of nervous systems. Emphasis on the vertebrate brain and the relationship of anatomy, physiology, and biochemistry to sensory perception, cognition, motor activity, and learning and memory. Prerequisite: 2201 and senior standing. [3] (MNS)

**NSC 4969. Senior Seminar in Neuroscience.** [Formerly NSC 299] Seminar with advanced reading, discussion, and writing on a specific topic in neuroscience. Limited to seniors. [3] (No AXLE Credit)

**NSC 4999. Honors Research.** [Formerly NSC 296] Participation in a research project under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of honors and independent study is

required. May be repeated for credit more than once, but students may earn only up to 4 credits per semester of enrollment. [2-4] (No AXLE credit)

## Philosophy

**PHIL 1001. Commons Seminar.** [Formerly PHIL 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**PHIL 1002. Introduction to Philosophy.** [Formerly PHIL 100] An introduction to the basic problems of philosophy based upon readings in the works of selected leading philosophers. Repeat credit for students who have completed 1002W. [3] (HCA)

**PHIL 1002W. Introduction to Philosophy.** [Formerly PHIL 100W] An introduction to the basic problems of philosophy based upon readings in the works of selected leading philosophers. Repeat credit for students who have completed 1002. [3] (HCA)

**PHIL 1003. General Logic.** [Formerly PHIL 102] A study of the uses of language, definition, informal fallacies, the theory of the syllogism, the basic operations of modern symbolic logic, and selected issues in inductive logic and scientific method. Emphasis is placed on the ambiguities and pitfalls of ordinary usage and on techniques for translating ordinary arguments into formal logic. [3] (MNS)

**PHIL 1004. Introduction to Asian Philosophy.** [Formerly PHIL 103] Philosophical thought of Asian origin, especially India and China, from ancient times to the present, theoretical and practical concerns. Repeat credit for students who have completed 1004W. [3] (INT)

**PHIL 1004W. Introduction to Asian Philosophy.** [Formerly PHIL 103W] Philosophical thought of Asian origin, especially India and China, from ancient times to the present, theoretical and practical concerns. Repeat credit for students who have completed 1004. [3] (INT)

**PHIL 1005. Introduction to Ethics.** [Formerly PHIL 105] A study of theories of the good life and of the nature of virtue. Readings in major texts and discussion of selected problems. [3] (P)

**PHIL 1008. Introduction to Medical Ethics.** [Formerly PHIL 108] Moral issues in the practice of medicine, biomedical research, policies and regulations related to health care. Repeat credit for students who have completed 1008W. [3] (P)

**PHIL 1008W. Introduction to Medical Ethics.** [Formerly PHIL 108W] Moral issues in the practice of medicine, biomedical research, policies and regulations related to health care. Repeat credit for students who have completed 1008. [3] (P)

**PHIL 1100. Introduction to Business Ethics.** [Formerly PHIL 110] Ethical issues arising from business and professional practice. Topics will include: corporate social responsibility, employee rights, technology and privacy in the workplace, corporate governance, and globalization. [3] (P)

**PHIL 1111. First-Year Writing Seminar.** [Formerly PHIL 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**PHIL 1200. The Meaning of Life.** [Formerly PHIL 120] Accounts of life's meaning. The relations between ways of living, happiness, and the fact of death. The individual's role in giving meaning to life. Readings from Mill, Tolstoy, Kierkegaard, and several contemporary thinkers. Repeat credit for students who have completed 1200W. [3] (HCA)

**PHIL 1200W. The Meaning of Life.** [Formerly PHIL 120W] Accounts of life's meaning. The relations between ways of living, happiness, and the fact of death. The individual's role in giving meaning to life. Readings from Mill, Tolstoy, Kierkegaard, and several contemporary thinkers. Repeat credit for students who have completed 1200. [3] (HCA)

**PHIL 2100. Ancient Philosophy.** [Formerly PHIL 210] An examination of the major Greek and Roman philosophers with emphasis on the works of Plato and Aristotle. [3] (HCA)

**PHIL 2101. Hellenistic and Late Ancient Philosophy.** [Formerly PHIL 218] Philosophical ideas of Stoics, Cynics, Epicureans, skeptics, Peripatetics, Neoplatonists, and early monotheist thinkers such as Philo, Origen, and Philoponus. [3] (HCA)

**PHIL 2102. Medieval Philosophy.** [Formerly PHIL 211] Comparative study of key figures in Islamic, Jewish, and Christian philosophy as they struggle with the philosophy of logic, metaphysics, language, culture, politics, ethics, and nature. [3] (INT)

**PHIL 2103. Modern Philosophy.** [Formerly PHIL 212] An examination of the major philosophers of modern Europe from Descartes and Spinoza through Locke, Berkeley, Hume, and Kant. [3] (HCA)

**PHIL 2104. Nineteenth-Century Philosophy.** [Formerly PHIL 228] A study of selected themes and writings from nineteenth-century European philosophers. [3] (INT)

**PHIL 2109. Twentieth-Century Continental Philosophy.** [Formerly PHIL 260] A study of selected twentieth-century philosophers such as Derrida, Foucault, and Lacan. [3] (HCA)

**PHIL 2110. Contemporary Philosophy.** [Formerly PHIL 213] An examination of selected problems treated in recent philosophical literature such as meaning, perception, knowledge, truth, and freedom. Readings from the Anglo American analytical and the phenomenological traditions. [3] (HCA)

**PHIL 2660. Philosophy of Music.** [Formerly PHIL 249] Music and meaning, language, emotion, expression, interpretation, performance, the body, and politics. No musical background is required. [3] (HCA)

**PHIL 2661. Philosophy of Sport.** Philosophical examination of sports, athletics, games, and play. Fairness, competition, cheating, aesthetics, embodiment, and doping. Role models, gender, exploitation, luck, and sports ethics. [3] (P)

**PHIL 3003. Formal Logic and Its Applications.** [Formerly PHIL 202] A self-contained course designed to convey an understanding of the concepts of modern formal logic, to develop convenient techniques of formal reasoning, and to make some applications of them in one or more of the following: psychology, linguistics, structuralist studies, information and computer sciences, and the foundations of mathematics. Philosophy 1003 is not required. [3] (MNS)

**PHIL 3004. Advanced Asian Philosophy.** [Formerly PHIL 203] Classical Asian philosophical texts. Historical development of practices and ideas; translation and interpretation issues; comparisons with European and other traditions of thought. [3] (INT)

**PHIL 3005. Jewish Philosophy.** [Formerly PHIL 261] Introduction to Jewish philosophy and the philosophical achievement of such major figures as Philo, Saadia, Maimonides, Levinas, and selected contemporary thinkers. [3] (HCA)

**PHIL 3006. Islamic Philosophy.** [Formerly PHIL 262] Introduction to the major figures of Islamic philosophy including Kindi, Razi, Farabi, Avicenna, and Ibn Khaldun. [3] (INT)

**PHIL 3007. French Feminism.** [Formerly PHIL 263] Introduction to the tradition of French feminist philosophy, including relevant works by Beauvoir, Cixous, Irigaray, Kristeva, LeDoeuff, Kofmann, and others. [3] (No AXLE credit)

**PHIL 3008. American Philosophy.** [Formerly PHIL 222] A study of the works of selected American philosophers from the colonial period to the present. [3] (US)

**PHIL 3009. Existential Philosophy.** [Formerly PHIL 224] A study of two or three existential philosophers and selected problems that arise in relation to their thought. [3] (HCA)

**PHIL 3010. Phenomenology.** [Formerly PHIL 226] Selected readings from such thinkers as Husserl, Sartre, and Merleau-Ponty on the structures of experience, the sources and limits of knowledge, mind, and body, interpersonal relations, and the meaning of freedom. [3] (HCA)

**PHIL 3011. Critical Theory.** [Formerly PHIL 232] The Frankfurt School; mass culture, ideology, and modernism in the arts; the disenchantment of reason; alienation and fascism; the prospects for experience and political

critique. Readings include Adorno, Horkheimer, Marcuse, Benjamin, and Habermas. [3] (HCA)

**PHIL 3012W. Writing as Political Resistance.** [Formerly PHIL 233W] Writings from the political margins from authors under house arrest, in exile, or in prison. Expressions of active resistance to oppressive, and occasionally violent, political institutions. [3] (P)

**PHIL 3013. History of Aesthetics.** [Formerly PHIL 240] History of philosophy of art, aesthetic experience, creativity, criticism, and related concepts. [3] (HCA)

**PHIL 3014. Modernistic Aesthetics.** [Formerly PHIL 241] Abstraction, nontraditional media, mixed media, new media, changes in artistic institutions, and the death of art. [3] (HCA)

**PHIL 3103. Immanuel Kant.** [Formerly PHIL 220] Kant's revolutionary critique of the foundations of human knowledge, moral obligation, and religious faith, with readings from his three Critiques and lesser works. [3] (HCA)

**PHIL 3104. Kierkegaard and Nietzsche.** [Formerly PHIL 247] A study of selected works. [3] (HCA)

**PHIL 3105. Hegel.** Selected works and themes. Experience, reason, freedom, history, and sociality. Modernity, dialectics, religion, and art. [3] (HCA)

**PHIL 3600. Philosophy of Knowledge.** [Formerly PHIL 216] Nature, sources, and scope of scientific, moral, and religious belief. Justification, knowledge, and skeptical challenges to their legitimacy. [3] (HCA)

**PHIL 3601. Metaphysics.** [Formerly PHIL 217] Selected problems in metaphysics such as ultimate explanation, meaning of existence, time and eternity, freedom and determinism, and science and religion. [3] (HCA)

**PHIL 3602. Philosophy of History.** [Formerly PHIL 231] Focus on alternative conceptions of time and history in Aristotle, Augustine, Kant, Hegel, Heidegger, and Benjamin. [3] (HCA)

**PHIL 3603. Philosophy of Education.** [Formerly PHIL 234] Analysis of educational concepts. Educational implications of theories of knowledge and theories of the individual. Emphasis on higher education. [3] (HCA)

**PHIL 3604. Gender and Sexuality.** [Formerly PHIL 235] Recent theories of the relation between sex, gender, and sexuality. Construction of gendered identities, and their relation to embodiment, gender politics, ethics and epistemology. [3] (P)

**PHIL 3605. Contemporary Ethical Theory.** [Formerly PHIL 238] A study of theories about the cognitive foundations of ethical discourses. Prerequisite: 1005. [3] (HCA)

**PHIL 3606. Moral Problems.** [Formerly PHIL 239] A discussion of specific moral problems such as the justification of abortion and euthanasia. Moral theories such as utilitarianism will be discussed, but the emphasis will be on their relevance to the solution of moral problems. Repeat credit for students who have completed 3606W. Prerequisite: 1005. [3] (P)

**PHIL 3606W. Moral Problems.** [Formerly PHIL 239W] A discussion of specific moral problems such as the justification of abortion and euthanasia. Moral theories such as utilitarianism will be discussed, but the emphasis will be on their relevance to the solution of moral problems. Repeat credit for students who have completed 3606. Prerequisite: 1005. [3] (P)

**PHIL 3607. Philosophy of Religion.** [Formerly PHIL 242] A study of various problems concerning religious experiences; ideas about religion and divinity. [3] (HCA)

**PHIL 3608. Ethics and Medicine.** [Formerly PHIL 270] Selected ethical issues raised by clinical practice, medical theories, and biomedical research and technology. No credit for students who have completed 1111, section 3. Prerequisite: 1005, 1008, or 1008W. [3] (P)

**PHIL 3609. Ethics and Business.** [Formerly PHIL 271] Moral problems in the business world including irresponsible marketing, conflict between profit and social conscience, resource use, public regulation of business, and the value of competition. Prerequisite: 1005. [3] (P)

**PHIL 3610. Ethics and Law.** [Formerly PHIL 272] Moral problems in the practice of law including conflicts of interest, confidentiality, limits of advocacy, and the obligations of lawyers to clients, courts, and the public. Re-

peat credit for students who have completed 3610W. Prerequisite: 1005. [3] (SBS)

**PHIL 3610W. Ethics and Law.** [Formerly PHIL 272W] Moral problems in the practice of law including conflicts of interest, confidentiality, limits of advocacy, and the obligations of lawyers to clients, courts, and the public. Repeat credit for students who have completed 3610. Prerequisite: 1005. [3] (SBS)

**PHIL 3611. Environmental Philosophy.** [Formerly PHIL 273] Environmental ethics (animal rights, respect for nature, the land ethic), science and the natural world, the aesthetics of nature, global justice, and sustainability. [3] (P)

**PHIL 3612. Ethics and Animals.** [Formerly PHIL 274] Ethical issues raised by human interactions with animals, including laboratory experiments, factory farming, hunting, zoos, and pet ownership. Challenges to ethical theory provoked by extending rights to animals. [3] (HCA)

**PHIL 3615. Philosophy of Film.** [Formerly PHIL 243] Challenges posed by film forms to traditional aesthetics and the novel philosophical approaches created to deal with them. Topics include the nature of the film image, film and experiential time, cinematic genres, the problem of mass art, and feminist critiques of spectatorship. Weekly screenings. [3] (HCA)

**PHIL 3616. Philosophy and the Natural Sciences.** [Formerly PHIL 244] Philosophical issues in the methodology, conceptual structure, patterns of explanation, historical development, and cultural impact of the natural sciences. Metaphysical and ethical implications. [3] (P)

**PHIL 3617. Philosophy of Language.** [Formerly PHIL 246] Philosophical problems in the methodology of linguistics, relations between thought and language, theories of meaning and symbolism, the nature of metaphor, the philosophical implications of theories of language acquisition. [3] (SBS)

**PHIL 3618. Philosophy and Literature.** [Formerly PHIL 248] Philosophical topics in novels or poetry. Examples include: meaning of life, linguistic meaning, good and evil, aesthetic value, and human freedom. Repeat credit for students who have completed 3618W. [3] (HCA)

**PHIL 3618W. Philosophy and Literature.** [Formerly PHIL 248W] Philosophical topics in novels or poetry. Examples include: meaning of life, linguistic meaning, good and evil, aesthetic value, and human freedom. Repeat credit for students who have completed 3618. [3] (HCA)

**PHIL 3620. Political and Social Philosophy.** [Formerly PHIL 252] Central issues and arguments concerning individual liberty, political authority, democracy, and justice. Key texts and arguments. Contemporary debates. [3] (P)

**PHIL 3621. Early Modern Political Philosophy.** [Formerly PHIL 257] A study of competing accounts of the best form of political association, which differ from Locke, through the works of Machiavelli, Hobbes, Spinoza, and Rousseau. [3] (INT)

**PHIL 3622. Contemporary Political Philosophy.** [Formerly PHIL 258] A focused and extended examination of selected topics in contemporary political theory, such as justice, liberty, rights, tolerance, and autonomy. Content varies depending on instructor. [3] (P)

**PHIL 3623. Modern Philosophies of Law.** [Formerly PHIL 254] Contemporary theories of legal validity, legal liability (criminal and civil), and contractual obligation with special attention to the controversy between legal positivism and "natural law" theories and the assessment of contemporary economic analyses of legal rights. [3] (SBS)

**PHIL 3630. Philosophy of Mind.** [Formerly PHIL 256] Selected problems in the philosophy of mind. Relation between mind and body, the nature of consciousness, the problem of other minds, the status of self-knowledge, and the possibility of machine and other intelligence. Connections with empirical investigations in related cognitive disciplines. [3] (SBS)

**PHIL 3657. Humanity, Evolution, and God.** [Formerly PHIL 245] The impact of the idea of evolution on our conception of personhood. Theistic and non-theistic approaches to philosophical anthropology, ethics and society, the theory of knowledge, the mind-body problem, and relations with the environment and other species. [3] (P)

**PHIL 3661. Topics in Aesthetics.** [Formerly PHIL 251] Philosophy of art and aesthetic theory. [3] (HCA)

**PHIL 3851. Independent Readings.** [Formerly PHIL 289A] Designed for majors not in the departmental honors program. Consists of a project to be carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [1-6; maximum of 12 credits total for four semesters of PHIL 3851 and 3852] (No AXLE credit)

**PHIL 3852. Independent Readings.** [Formerly PHIL 289B] Designed for majors not in the departmental honors program. Consists of a project to be carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [1-6; maximum of 12 credits total for four semesters of PHIL 3851 and 3852] (No AXLE credit)

**PHIL 3891. Selected Topics.** [Formerly PHIL 294A] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**PHIL 3892. Selected Topics.** [Formerly PHIL 294B] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit) (No AXLE credit)

**PHIL 4999. Honors Independent Study.** [Formerly PHIL 295] Designed for students in the Honors Program in philosophy. Consists of guided reading, periodic reports, and work on honors thesis. May be repeated for credit once, but students may earn only up to 6 credits per semester of enrollment. [3-6; maximum of 12 credits total for all semesters of PHIL 4999] (No AXLE credit)

## Physics

**PHYS 1001. Commons Seminar.** [Formerly PHYS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**PHYS 1010. Introductory Physics.** [Formerly PHYS 110] Normally accompanied by 1010L. Motion, forces, conservation laws, light, heat, and electricity. Quantum theory, the atomic nucleus, elementary particles, and properties of materials. Special relativity, Big Bang, and cosmology. Primarily intended for those who do not expect to major in science. No credit for students who have earned credit for 1050. [3] (MNS)

**PHYS 1010L. Introductory Physics Laboratory.** [Formerly PHYS 111] Laboratory to accompany 1010. Corequisite: 1010. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1010. [1] (No AXLE credit)

**PHYS 1111. First-Year Writing Seminar.** [Formerly PHYS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**PHYS 1501. Introductory Physics for the Life Sciences I.** [Formerly PHYS 113A] Normally accompanied by 1501L. Calculus-based introduction to physics taught within the context of life science applications. Mechanics, fluids, sound, thermal, and statistical physics. Prospective majors are strongly advised to take Math 1300 or a higher level calculus course. Prior study of calculus or concurrent enrollment in Math 1100, 1200, or 1300 is expected. No credit for students who have earned credit for 1601 or 1901. [3] (MNS)

**PHYS 1501L. Laboratory for Introductory Physics for the Life Sciences I.** [Formerly PHYS 114A] Laboratory to accompany Physics 1501.

Normally accompanied by 1501. Satisfies the AXLE lab course requirement when completed with 1501 (strongly preferred) or 1601. No credit for students who have earned credit for 1601L or 1901. [1] (No AXLE credit)

**PHYS 1502. Introductory Physics for the Life Sciences II.** [Formerly PHYS 113B] Normally accompanied by 1502L. Calculus-based introduction to physics taught within the context of life science applications. Electricity and magnetism; geometric and physical optics; atomic, nuclear, and quantum physics. Prospective majors are strongly advised to take Math 1301 or a higher level calculus course. Prior study of calculus or concurrent enrollment in Math 1100, 1201, or 1301 is expected. No credit for students who have earned credit for 1602 or 1902. [3] (MNS)

**PHYS 1502L. Laboratory for Introductory Physics for the Life Sciences II.** [Formerly PHYS 114B] Laboratory to accompany Physics 1502. Normally accompanied by 1502. Satisfies the AXLE lab course requirement when completed with 1502 (strongly preferred) or 1602. No credit for students who have earned credit for 1602L or 1902. [1] (No AXLE credit)

**PHYS 1601. General Physics I.** [Formerly PHYS 116A] Normally accompanied by 118a. Calculus-based introduction to general physics and its applications. Mechanics, heat, and sound. Potential majors are strongly advised to take MATH 1300 or a higher level calculus course. Prior study of calculus or concurrent enrollment in MATH 1200 or 1300 is expected. No credit for students who have earned credit for 1501 or 1901. [3] (MNS)

**PHYS 1601L. General Physics Laboratory I.** [Formerly PHYS 118A] Laboratory to accompany Physics 1601. Normally accompanied by 1601. Satisfies the AXLE lab course requirement when completed with 1601 (strongly preferred) or 1501. No credit for students who have earned credit for 1501L or 1901. [1] (No AXLE credit)

**PHYS 1602. General Physics II.** [Formerly PHYS 116B] Normally accompanied by 1602L. Calculus-based introduction to general physics and its applications. Electricity and magnetism, optics, modern physics. Potential majors are strongly advised to take MATH 1301 or a higher level calculus course. Prior study of calculus or concurrent enrollment in MATH 1201 or 1301 is expected. No credit for students who have earned credit for 1502 or 1902. [3] (MNS)

**PHYS 1602L. General Physics Laboratory II.** [Formerly PHYS 118B] Laboratory to accompany Physics 1602. Normally accompanied by 1602. Satisfies the AXLE lab course requirement when completed with 1602 (strongly preferred) or 1502. No credit for students who have earned credit for 1502L or 1902. [1] (No AXLE credit)

**PHYS 1901. Principles of Physics I.** [Formerly PHYS 121A] Classical dynamics, conservation laws, gravitation, wave motion, and thermodynamics. Designed for first-year students who plan to major in physics or in related disciplines. Three lectures and a one-hour discussion period on modern topics of interest. One three-hour laboratory per week. Students who have earned credit for both 1501 and 1501L or both 1601 and 1601L will earn one hour of credit for this course. Students who have earned credit for 1501 or 1601 only will earn two hours of credit for this course. Students who have earned credit for 1501L or 1601L only will earn four hours of credit for this course. Prerequisite or corequisite: MATH 1301 or 2200. [5] (MNS)

**PHYS 1902. Principles of Physics II.** [Formerly PHYS 121B] Continuation of 1901. Electromagnetism, optics, relativity, quantum mechanics, and atomic and nuclear physics. Designed for first-year students who plan to major in physics or in related disciplines. Three lectures and a one-hour discussion period on modern topics of interest. One three-hour laboratory per week. Students who have earned credit for both 1502 and 1502L or both 1602 and 1602L will earn one hour of credit for this course. Students who have earned credit for 1502 or 1602 only will earn two hours of credit for this course. Students who have earned credit for 1502L or 1602L only will earn four hours of credit for this course. Prerequisite or corequisite: MATH 2300 or 2500. [5] (MNS)

**PHYS 2210. Classical and Modern Optics.** [Formerly PHYS 221] Geometrical optics, including reflection, refraction, ray tracing, aberrations, and interference. Physical optics, including wave theory, absorption, dispersion, diffraction, and polarization. Properties of light from lasers and synchrotron sources. Photodetectors and optical technology. Prerequisite: either 1502 or 1602 or 1902; and either MATH 1201 or 1301. [3] (MNS)

**PHYS 2237. Computational Physics.** [Formerly PHYS 257] Topics in modern physics analyzed exclusively with computer programs. Three-body solar system orbits. Random walk diffusion and entropy growth. Magnetism in the second order using model, non-equilibrium molecular dynamics. Solutions to the Schrödinger equation with numerical methods. Prerequisite: either 1502 or 1602 or 1902; and either MATH 1201 or 1301. [3] (MNS)

**PHYS 2250. Concepts and Applications of Quantum Mechanics.** [Formerly PHYS 225] Atomic and molecular structure, interaction of light with atoms and molecules, and spectroscopy. One three-hour laboratory per week. Repeat credit for students who have completed 2250W. Prerequisite: either 1502 or 1602 or 1902. Prerequisite or corequisite: MATH 2300 or 2500. [4] (MNS)

**PHYS 2250W. Concepts and Applications of Quantum Mechanics.** [Formerly PHYS 225W] Atomic and molecular structure, interaction of light with atoms and molecules, and spectroscopy. One three-hour laboratory per week. Repeat credit for students who have completed 2250. Prerequisite: either 1502 or 1602 or 1902. Prerequisite or corequisite: MATH 2300 or 2500. [4] (MNS)

**PHYS 2260. Modern Physics.** [Formerly PHYS 226] Condensed-matter physics, biophysics, special theory of relativity, and nuclear and particle physics. One three-hour laboratory per week. Repeat credit for students who have completed 226. Prerequisite: either 1502 or 1602 or 1902. Prerequisite or corequisite: MATH 2300 or 2500. [4] (MNS)

**PHYS 2260W. Modern Physics.** [Formerly PHYS 226W] Condensed-matter physics, biophysics, special theory of relativity, and nuclear and particle physics. One three-hour laboratory per week. Repeat credit for students who have completed 2260. Prerequisite: either 1502 or 1602 or 1902. Prerequisite or corequisite: MATH 2300 or 2500. [4] (MNS)

**PHYS 2270. Classical Mechanics I.** [Formerly PHYS 227A] Vector algebra and coordinate transformations. Gravity and potential energy. Free, forced, damped, and nonlinear harmonic oscillations. Chaos in simple mechanical systems. Lagrangian and Hamiltonian dynamics. The calculus of variations. Prerequisite: either 1502 or 1602 or 1902; and either MATH 1201 or 1301. [3] (MNS)

**PHYS 2271. Classical Mechanics II.** [Formerly PHYS 227B] Continuation of 2270. Orbital and rotational angular momentum and gravitational and Coulomb central-force problems, motion in non-inertial reference frames; coupled oscillators and normal modes; rigid-body motion; continuous systems and the wave equation; special relativity. Prerequisite: 2270. [3] (MNS)

**PHYS 2290. Electricity, Magnetism, and Electrodynamics I.** [Formerly PHYS 229A] Electrostatic fields and potentials. Gauss's law. Electrical properties of insulators, semiconductors, and metals. The Lorentz force. Magnetic fields and forces. Electromagnetic induction, Maxwell's equations, and electromagnetic waves. Prerequisite: either 1502 or 1602 or 1902; and either MATH 1301 or 2200. [3] (MNS)

**PHYS 2291. Electricity, Magnetism, and Electrodynamics II.** [Formerly PHYS 229B] Continuation of 2290. Electromagnetic waves in dielectrics and conductors. Electromagnetic radiation in waveguide structures. Relativistic electrodynamics. Magnetism as a relativistic phenomenon. Prerequisite: 2290 and either MATH 2400, 2420, or 2610. [3] (MNS)

**PHYS 2660. Experimental Nanoscale Fabrication and Characterization.** [Formerly PHYS 266] Laboratory course introduction to nanofabrication and characterization. Independent and original research in nanotechnology and nanoscience. Nanomaterials, nanoelectronics, and photonics. Repeat credit for students who completed 240 section 1 in fall 2010 or fall 2011. Prerequisite: One of (2250 or 2250W) and one of (2260 or 2260W); or one of (1501, 1601, or 1901) and one of (CHEM 1602L or MSE 1500). [3] (MNS)

**PHYS 2805. Foundations of Medical Imaging.** [Formerly PHYS 228] Physics and engineering of image formation for medical applications. Mathematical concepts of image formation and analysis. Techniques for recording images using ionizing radiation, including CT, ultrasound, magnetic resonance; and nuclear, including SPECT and PET. Methods of evaluating image quality. No credit for students who have earned credit for

BME 4400. Prerequisite: 1502, 1602, or 1902; and Mathematics: MATH 2400; or one of (MATH 2410, 2600, 2501) and one of (MATH 2420, 2610). [3] (No AXLE credit)

**PHYS 3122. Physics of Living Systems.** Physical principles applied to biological phenomena. Development of physical models of biological systems on scales ranging from molecules to organisms. Biological applications of mechanics, thermodynamics, and dynamical systems. Prerequisite: 1502, 1602, or 1902; and MATH 2400, 2420, or 2610. [3] (MNS)

**PHYS 3125. Health Physics.** [Formerly PHYS 243] Theory and instrumentation in health physics and radiological physics. Radiation shielding design, methods of external and internal dosimetry, and radiation regulatory issues. Prerequisite: Either 2250 or 2250W and either Math 1201 or 1301. [3] (MNS)

**PHYS 3200. Thermal and Statistical Physics.** [Formerly PHYS 223] Temperature, work, heat, and the first law of thermodynamics. Entropy and the second law of thermodynamics. Kinetic theory of gases with applications to ideal gases and electromagnetic radiation. Prerequisite or corequisite: 2270. Serves as repeat credit for students who have completed 3207. [3] (MNS)

**PHYS 3207. Computational Thermal and Statistical Physics.** [Formerly PHYS 223C] Temperature, work, heat, and the first law of thermodynamics. Entropy and the second law of thermodynamics. Kinetic theory of gases with applications to ideal gases and electromagnetic radiation. Prerequisite or corequisite: 2270. Serves as repeat credit for students who have completed 3200. [3] (MNS)

**PHYS 3600. Undergraduate Seminar.** [Formerly PHYS 250] Directed readings and discussions of current topics in physics. Preference to majors for enrollment. Prerequisite or corequisite: 2250, 2250W, 2260, or 2260W. [1] (No AXLE credit)

**PHYS 3640. Physics of Condensed Matter.** [Formerly PHYS 254] Crystal structure and diffraction. Phonons and lattice vibrations. Free-electron theory of metals. Elementary band theory of solids. Semiconductors. Optical properties of insulators. Applications to solid-state devices, magnetism, and superconductivity. Prerequisite: 2270 and either 3200 or 3207. Prerequisite or corequisite: either 2250 or 2250W and either 2260 or 2260W. [3] (MNS)

**PHYS 3645. Radiation Detectors and Measurements.** [Formerly PHYS 285] Basic physics principles and applications of radiation detecting instruments, with laboratory exercises. Techniques and instrumentation for nuclear radiation detection and measurements as they relate to health physics (radiation safety) and nuclear physics. [4] (MNS)

**PHYS 3651. Advanced Quantum Mechanics I.** [Formerly PHYS 251A] Wave-particle duality, indeterminacy, superposition, the Schrödinger equation, angular momentum, the hydrogen atom, and spin and indistinguishability. Prerequisite: Either 2250 or 2250W; either 2260 or 2260W; and Mathematics: MATH 2400; or one of (MATH 2410, 2600, 2501) and one of (MATH 2420, 2610). [3] (MNS)

**PHYS 3652. Advanced Quantum Mechanics II.** [Formerly PHYS 251B] Time-independent and time-dependent perturbation theory, matrix theory, scattering, applications to atomic physics, condensed matter physics, and astrophysics. Prerequisite: 2290 and 3651. [3] (MNS)

**PHYS 3660. Introduction to Particle Physics.** [Formerly PHYS 255] Weak, strong, and electromagnetic forces as evidenced by the interactions of elementary particles. Classification of particles and experimental techniques. Prerequisite or corequisite: either 2250 or 2250W and either 2260 or 2260W. [3] (MNS)

**PHYS 3820. Methods in Physics Laboratory Teaching.** Developing and running physics labs and classroom lecture demonstrations. Understanding safety protocols. Enrollment open only to students who are Secondary Education, Elementary Education, or Education Studies majors, are also either Physics majors or minors, and who have completed any 12 credit hours in satisfaction of requirements for major or minor in Physics. [3] (MNS)



**PHYS 3840. Directed Study.** [Formerly PHYS 289] Individual research or readings under close faculty supervision. May be repeated for a total of 10 credits, but students may earn only up to 5 credits per semester of enrollment. Prerequisite: either 2250 or 2250W and either 2260 or 2260W. [1-5] (No AXLE credit)

**PHYS 3860. Independent Study.** [Formerly PHYS 291] Introduction to independent research and scholarly investigation under faculty supervision. May be repeated for a total of 10 credits, but students may earn only up to 6 credits per semester of enrollment. Prerequisite or corequisite: multivariable calculus and either 2250 or 2250W and either 2260 or 2260W. [1-6; maximum of 10 credits total for all semesters of PHYS 3860] (No AXLE credit)

**PHYS 3890. Selected Topics.** [Formerly PHYS 240] Prerequisite or corequisite: either 2250 or 2250W and either 2260 or 2260W. [1-3] (No AXLE credit)

**PHYS 4998. Honors Research and Senior Thesis.** [Formerly PHYS 296] Independent experimental or theoretical investigations of basic problems in physics under faculty supervision, culminating in a written thesis submitted to the faculty. Required for departmental honors in physics. May be repeated for a total of 10 credits, but students may earn only up to 6 credits per semester of enrollment. Prerequisite: senior standing, major in Physics and Astronomy, and departmental approval. Prerequisite or corequisite: multivariable calculus and either 2250 or 2250W and either 2260 or 2260W. [1-6; maximum of 10 credits total for all semesters of PHYS 4998] (No AXLE credit)

## Political Science

**PSCI 1001. Commons Seminar.** [Formerly PSCI 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**PSCI 1100. Introduction to American Government and Politics.** [Formerly PSCI 100] A descriptive survey of the constitutional and structural principles, processes, and functions of the American governmental system. [3] (US)

**PSCI 1101. Introduction to Comparative Politics.** [Formerly PSCI 101] Democracy, communism, and authoritarian rule in developed and developing countries; political institutions and public policy in diverse national settings; principles of comparative analysis. [3] (SBS)

**PSCI 1102. Introduction to International Politics.** [Formerly PSCI 102] Significant patterns and trends in twentieth- and twenty-first-century world politics: modes of conducting relations among nations, instruments for promoting national and supranational interests, and controls over international disputes. Emphasis upon episodes throwing light on the causes of war and the conditions of peace. [3] (SBS)

**PSCI 1103. Justice.** [Formerly PSCI 103] Different understandings of and debates concerning justice. Equality and freedom, individualism and community, diversity, patriotism, and representation. [3] (HCA)

**PSCI 1111. First-Year Writing Seminar.** [Formerly PSCI 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 115F course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**PSCI 1150. U.S. Elections.** [Formerly PSCI 150] Examination of the presidential and congressional elections. The recruitment of candidates, nomination processes, financing campaigns, media coverage, polling, predictive models, and implications of results. (during presidential election years). [3] (US)

**PSCI 2202. Ancient Political Thought.** [Formerly PSCI 202] Greek and Roman political traditions. Plato, Aristotle, Cicero, and early Christian thinkers. Questions of justice, equality, democracy, and political knowledge. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2203. History of Modern Political Philosophy.** [Formerly PSCI 203] Intensive analysis of the principal political philosophers in the modern tradition. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2205. Contemporary Political Theory.** [Formerly PSCI 205] Debates in contemporary political thought. Justice, democracy, freedom, identity, and individualism. Includes emerging contemporary theories. Serves as repeat credit for students who completed 201 before fall 2010. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2207. Liberalism and Its Critics.** [Formerly PSCI 207] The liberal tradition in political theory and its major challengers. Critical debates surrounding the relationship between individuals and political community, rights, freedom and equality. Repeat credit for students who have completed 2207W. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2207W. Liberalism and Its Critics.** [Formerly PSCI 207W] The liberal tradition in political theory and its major challengers. Critical debates surrounding the relationship between individuals and political community, rights, freedom and equality. Repeat credit for students who have completed 2207. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2208. Law, Politics, and Justice.** [Formerly PSCI 208] Contemporary and classical theories of law and society: rights theories, gender and the law; law and transitions to democracy; law between nations. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2209. Issues in Political Theory.** [Formerly PSCI 209] Topics vary from semester to semester. May be repeated once if there is no overlap with previous offerings. Prerequisite: 2202, 2203, or 2205. [3] (No AXLE credit)

**PSCI 2210. West European Politics.** [Formerly PSCI 210] Analysis of political development, social forces, institutions, and public policy in Great Britain, France, Germany, Italy, and Sweden. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 2213. Democratization and Political Development.** [Formerly PSCI 213] Comparative study of political development, with a focus on institutions. The effect of political choices about voting systems, executive and legislative powers, cabinet formation, and other institutions on political competition, parties and government stability. Cases from established democracies and countries undergoing democratization. No credit for students who have taken 8317. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2215. Change in Developing Countries.** [Formerly PSCI 215] Comparative study of political and economic change in developing countries. Political implications of ethnicity, economic dependency, and environmental degradation. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2216. The Chinese Political System.** [Formerly PSCI 216] Governmental institutions and political processes in the People's Republic of China with emphasis upon the interaction of traditional and revolutionary elements. Some attention to Taiwan since 1950 and to the overseas Chinese as parts of the Chinese political universe. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 2219. Politics of Mexico.** [Formerly PSCI 219] A survey of contemporary Mexican politics from a comparative perspective. Interaction of economic, social, and political forces that led to the demise of one of the world's most durable one-party political regimes and the prolonged transition to democracy. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2220. Crisis Diplomacy.** [Formerly PSCI 220] Foreign policy decision making and strategy. Emphasis on differences between crises that lead to war and those that do not. Foreign relations of Britain, France, Germany, Russia, and Japan. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2221. Causes of War.** [Formerly PSCI 221] Scientific study of the onset of expansion and consequences of war; conditions of peace, emphasizing alliances, arms races, and crisis escalation. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2222. American Foreign Policy.** [Formerly PSCI 222] Critical analysis of major international and domestic factors shaping U.S. foreign relations as reflected in selected twentieth- and twenty-first-century experiences. No credit for students who have taken 1111, Section 1. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2223. European Political Economy and Economic Institutions.** [Formerly PSCI 223] Policy-making processes of key economic institutions that influence the global political economy. International and financial regulatory reforms. World Trade Organization negotiations and current European economic issues. No credit for students who earned credit for PSCI 285 section 1 in summer 2011. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2225. International Political Economy.** [Formerly PSCI 225] Survey of major issues involving the interaction of political and economic forces at the global level. Particular attention to theories of interdependence and imperialism, the position of developing countries in the international system, multinational corporations, and the economic origins of war. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2226. International Law and Organization.** [Formerly PSCI 226] The role of international law and international organizations in the contemporary global political system. Focus on the evolution and impact of international law, the United Nations, the International Monetary Fund (IMF), and selected regional organizations. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2230. Middle East Politics.** [Formerly PSCI 230] Cross-national analysis of political institutions, political economies, and processes of change in the Middle East. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2236. The Politics of Global Inequality.** [Formerly PSCI 236] Causes of international inequality in the distribution of wealth. The emergence of rich and poor nations, and rich and poor people. Factors related to economic development, and their impact on income distribution. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2237. African Politics.** [Formerly PSCI 237] Pre-colonial to the present. State-building, socioeconomic development, public service provision, and foreign interventions. Conflict including: separatism, insurgency, slavery, genocide, and gender-based violence. Rise of democracy including party systems, voting behavior, electoral competition, fraud. Identity politics of ethnicity, gender, class, and clash of Western and local norms. Offered on a graded basis only. Repeat credit for 284-01 taken in Spring 2014. Prerequisite or corequisite: 1100 {100}, 1101 {101}, 1102 {102}, 1103 {103}, or 1150 {150}. [3] (SBS)

**PSCI 2240. Political Parties.** [Formerly PSCI 240] Theories of party formation, organization, and behavior. Historical development of party systems. Criteria for the comparative evaluation of party systems. Parties as instruments of citizen control. Implications for electoral outcomes, coalition formation, legislative decision making, and public policy. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2243. Political Campaigns and the Electoral Process.** [Formerly PSCI 243] Theories of representation and democratic accountability; electoral strategies and tactics, including political polling and analysis. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2245. The American Presidency.** [Formerly PSCI 245] Constitutional, historical, and political aspects. Attention to electing and nominating president, presidential leadership and personality, governing, and relations with Congress and the public. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

**PSCI 2251. The Politics of U.S. and Global Immigration.** [Formerly PSCI 251] Political, philosophical, and moral issues. Serves as repeat credit for students who completed 283 section 1 in spring 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 2255. Public Policy Problems.** [Formerly PSCI 255] Specific problems of public policies and their relations to political and institutional structures. Particular policy problems vary from semester to semester. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 2256. Politics of Public Policy.** [Formerly PSCI 256] Understanding and navigating the policy process. Public opinion, media, elections, interest groups, and agenda settings. Legislatures, executives, decision-making, implementation, and policy feedback. Current policy issues. Serves as repeat credit for students who completed 255 in spring 2011. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2259. Political Strategy and Game Theory.** [Formerly PSCI 259] Campaigns and elections, legislative politics, political bargaining, and political organization. Applications of decision and game theory. Models of complete and perfect information, and games of incomplete information. No credit for students who have earned credit for 359. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2262. The Judicial Process.** [Formerly PSCI 262] Functioning of the judiciary in the American political process; operation and powers of the courts; non-legal aspects of the judicial process; political role and effects of judicial decisions. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2263. Religion and Politics.** [Formerly PSCI 263] Religion in democratic societies. Abortion, gay marriage, faith-based initiatives, and the Pledge of Allegiance. Historical works and contemporary contributions to debates. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 2265. Constitutional Law: Powers and Structures of Government.** [Formerly PSCI 265] U.S. constitutional system and fundamental principles of constitutional interpretation. Judicial development of principles of distribution and scope of governmental powers. Case method. No credit for students who have earned credit for 261. Repeat credit for students who completed 261a prior to fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

**PSCI 2266. Constitutional Law: Civil Liberties and Rights.** [Formerly PSCI 266] Supreme Court's interpretation of the Bill of Rights and the Fourteenth Amendment. Case method. No credit for students who have earned credit for 261. Repeat credit for students who earned credit for 261b prior to fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

**PSCI 2267. Voting and Political Representation in America.** [Formerly PSCI 267] The history of voting rights and the efficacy of representation in the American political system. Political participation, voting rights, felony disenfranchisement, redistricting, and alternative electoral systems. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

**PSCI 2270. Conducting Political Research.** [Formerly PSCI 270] Research sources, designs, and methods used by political scientists. Locating and accessing data, the logic of causal inferences, and basic data presentation and analysis. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2273. Conflict Management.** [Formerly PSCI 273] Conflict management in international and domestic disputes. Negotiation, mediation, adjudication, intervention, and peacekeeping. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2274. Nature of War.** [Formerly PSCI 274] Warfare from ancient to contemporary times. Western and non-Western perspectives. Views from political science, philosophy, history, and official U.S. military doctrine. Interplay among international politics, military strategy, technology, and psychology. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 2279. Logic of Politics.** [Formerly PSCI 279] Rational choice analysis of politics. Individual and collective choice. Collective action, public

goods, and externalities. Prerequisite or corequisite: 100, 101, 102, 103, or 150. [3] (SBS)

**PSCI 3211. The European Union.** [Formerly PSCI 211] Political and economic integration. Origins, institutions, decision processes, policies, achievements, and prospects of the European integration movement. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 3217. Latin American Politics.** [Formerly PSCI 217] Cross-national analysis of political institutions, cultures, and processes of change in Latin America. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 3228. International Politics of Latin America.** [Formerly PSCI 228] Examination of Latin America's role in the international and inter-American system. Special attention to the international response to revolutionary change in the area, and to the region's major actors and their changing relationship with the United States, with other major powers, and with other actors such as multinational corporations and international financial institutions. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 3229. Strategy and International Politics.** [Formerly PSCI 229] Strategic behavior and strategic choices arising from interactive decision making within the context of international politics. General principles of strategy. In-class experiments and game playing. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3235. Political Islam.** [Formerly PSCI 235] Rise of political Islam. Origins, goals, and practices of specific Islamic groups throughout the Middle East. Global and local causes of Islamic political mobilization, and the American response to that mobilization. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 3241. American Public Opinion and Voting Behavior.** [Formerly PSCI 241] The development and dynamics of political opinion and its effects on voting and public policy. Models of political behavior. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3244. The Legislative Process.** [Formerly PSCI 244] Legislative organization and processes in the U.S. Congress. Attention to parties, elections, institutional structure, interest groups, and other branches of government as they relate to the legislative process. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3247. American Political Culture.** [Formerly PSCI 247] Content, historical development, and political consequences of the American public's deeply rooted values concerning how the political system ought to work and the ends it ought to serve. Attention to regional variation. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

**PSCI 3249. American Public Opinion and American Politics.** [Formerly PSCI 249] Origins and effects of public opinion on politics in the United States. Influence of values, emotion, prejudice, and news information on individual political views. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3250. Group Conflict and Cooperation in U.S. Politics.** [Formerly PSCI 250] Psychological and institutional sources of division and unity in American politics. Identity formation and change, explicit and implicit racial attitudes, and political tolerance. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3252. Business and Public Policy.** [Formerly PSCI 252] Relationships among business, public policy, and political strategy in the United States and other political systems. Lobbying and legislative politics, antitrust and regulation, intellectual property, international trade, and ethics and corporate social responsibility. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3253. Ethics and Public Policy.** [Formerly PSCI 253] Political and moral values in assessing policy-making, public policies and processes, and policy impacts. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 3254. Political Psychology.** [Formerly PSCI 254] Interface between politics and the psychological processes of individuals and groups. Cogni-

tion, emotion, identity and intergroup relations, leadership, and extremism. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3258. Democratic Theory and Practice.** [Formerly PSCI 258] Theories of democratic institutions, practices, and values in historical and contemporary political thought. Impact of popular participation on issues of justice, equality, individual freedom, and political power. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 3260. Introduction to American Law.** [Formerly PSCI 260] Law as a component of public policy and the political system; the elements and rationale of private law. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3264W. Global Feminisms.** [Formerly PSCI 264W] Global politics through feminist perspectives. Interrelated systems of power. Race, gender, sexuality, colonialism, and imperialism. Health, genocide, and slavery. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

**PSCI 3268. American Health Policy.** [Formerly PSCI 268] Structure of the American health care system. Challenges to providing care and improving health. Private and public insurance, inequality, cost growth, quality of care, and reform. Serves as repeat credit for students who completed 283 section 4 in spring 2011 or section 3 in fall 2011. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3271. Feminist Theory and Research.** [Formerly PSCI 271] Introduction to feminist works in the social sciences. Development of feminist analysis. Important issues, feminist theories, and approaches to social criticism. Methodological challenges to feminist research. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (P)

**PSCI 3272W. The War in Iraq, 2003-2011.** [Formerly PSCI 272W] The structure of and changes in the U.S. military. Development of Iraqi political institutions. American foreign policy making. Serves as repeat credit for students who completed 287 section 1 in fall 2010 or HUM 161 section 1 in fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

**PSCI 3275. National Security.** [Formerly PSCI 275] How states ensure their national security. Origins of the security dilemma; the use of power, deterrence, coercion, engagement, and interstate cooperation in settling disputes. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 3841. Directed Study.** [Formerly PSCI 291A] Participation in research projects under the direction of a faculty supervisor. Consent of both the faculty supervisor and the director of undergraduate studies is required. Open only to junior and senior majors. May be repeated for a total of 6 credits in 290a, 290b, 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3] (No AXLE credit)

**PSCI 3842. Directed Study.** [Formerly PSCI 291B] Participation in research projects under the direction of a faculty supervisor. Consent of both the faculty supervisor and the director of undergraduate studies is required. Open only to junior and senior majors. May be repeated for a total of 6 credits in 290a, 290b, 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3; maximum of 6 credits total for all semesters of PSCI 290a, 290b, 3841, 3842, 3851, and 3852] (No AXLE credit)

**PSCI 3851. Independent Research.** [Formerly PSCI 289A] Development of a research project by the individual student under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Normally open only to majors in political science. May be repeated for a total of 6 credits in 290a, 290b, 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3; maximum of 6 credits total for all semesters of PSCI 290a, 290b, 3841, 3842, 3851, and 3852] (No AXLE credit)

**PSCI 3852. Independent Research.** [Formerly PSCI 289B] Development of a research project by the individual student under direction of a

faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Normally open only to majors in political science. May be repeated for a total of 6 credits in 290a, 290b, 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3; maximum of 6 credits total for all semesters of PSCI 290a, 290b, 3841, 3842, 3851, and 3852] (No AXLE credit)

**PSCI 3880. Internship Training.** [Formerly PSCI 280A] Under faculty supervision, students from any discipline gain experience with local, state, national, and international government offices or other politically related organizations. A thorough report and research paper are submitted at the end of the semester. Completion of 6 hours of political science, normally a 2.90 grade point average, and prior department approval of the student's plan are required. May be taken on a Pass/Fail basis only and must be taken concurrently with 3882 and/or 3883. These hours may not be included in the minimum hours required in the political science major. Corequisite: 3882 and/or 3883. [1-9] (No AXLE credit)

**PSCI 3882. Internship Readings.** [Formerly PSCI 280C] Under faculty supervision, students from any discipline gain experience with local, state, national, and international government offices or other politically related organizations. A thorough report and research paper are submitted at the end of the semester. Completion of 6 hours of political science, normally a 2.90 grade point average, and prior department approval of the student's plan are required. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit)

**PSCI 3883. Internship Research.** [Formerly PSCI 280B] Under faculty supervision, students from any discipline gain experience with local, state, national, and international government offices or other politically related organizations. A thorough report and research paper are submitted at the end of the semester. Completion of 6 hours of political science, normally a 2.90 grade point average, and prior department approval of the student's plan are required. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit)

**PSCI 3891. Topics in Contemporary Politics.** [Formerly PSCI 281] Political, governmental, and policy issues. May be repeated for credit when topics vary. No more than three hours may be counted toward the major. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3] (No AXLE credit)

**PSCI 3893. Selected Topics in American Government.** [Formerly PSCI 283] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 3894. Selected Topics in Comparative Politics.** [Formerly PSCI 284] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 3895. Selected Topics in International Politics.** [Formerly PSCI 285] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 3896. Selected Topics in Political Theory.** [Formerly PSCI 286] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 3897. Selected Topics.** [Formerly PSCI 287] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. No more than a total of 6 credits may be earned for 3897 and 3898 combined. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 4238. Comparative Political Parties.** [Formerly PSCI 238] Political parties and their role in the democratic process of modern liberal

western democracies, focusing on party systems and party organizations. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 4257. The Politics of Capitalism.** [Formerly PSCI 257] Commerce and capitalism in social and political life from the eighteenth century to the present. Questions of justice and equality, freedom, and democratic politics. Serves as repeat credit for students who completed 207 in fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

**PSCI 4277. Future of Warfare.** [Formerly PSCI 277] Political, societal, and technological factors that could affect the future conduct of warfare. Insurgency and counterinsurgency. Military operations other than war. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

**PSCI 4998. Senior Honors Research.** [Formerly PSCI 299A] Open only to seniors in the departmental honors program. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

**PSCI 4999. Senior Honors Research.** [Formerly PSCI 299B] Open only to seniors in the departmental honors program. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

## Portuguese

**PORT 1001. Commons Seminar.** [Formerly PORT 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**PORT 1103. Intensive Elementary Portuguese.** [Formerly PORT 102] Accelerated introduction to reading, writing, speaking, and listening. Emphasis on practical usage. Intended for students with prior or current study of another Romance language. No credit for students who have earned credit for 1101, 1102, or a higher level Portuguese language course. [4] (INT)

**PORT 1111. First-Year Writing Seminar.** [Formerly PORT 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**PORT 2203. Intermediate Portuguese.** [Formerly PORT 200] Review of Portuguese grammar with emphasis on conversation, composition, and reading of modern Portuguese literary texts. No credit for students who have earned credit for a higher level Portuguese language course. Prerequisite: 1103. [3] (INT)

**PORT 2900. Brazilian Civilization through English Language Material.** [Formerly PORT 291] The cultural heritage of Brazil from its earliest days to the present. National identity, race relations, and Brazil's emergence as a major force in the Americas and beyond. Taught in English. No credit for graduate students in Spanish and Portuguese. No credit for students who have earned credit for 1111 section 1. [3] (P)

**PORT 3301. Portuguese Composition and Conversation.** [Formerly PORT 201] Expository writing and development of speaking skills. Emphasis on pronunciation, vocabulary, and grammar. No credit for students who have earned credit 202. Prerequisite: 2203. [3] (INT)

**PORT 3302. Brazilian Pop Culture.** [Formerly PORT 203] Development of written and oral communication skills through the study of Brazilian popular culture. Movies, music, television, and magazines. Prerequisite: 2203. [3] (INT)

**PORT 3303. Introduction to Luso-Brazilian Literature.** [Formerly PORT 205] Critical readings and methods of literary analysis. Masterpieces from Portugal and Brazil from all genres in several periods. Conversation and writing. Prerequisite: 3301 or 3302. [3] (HCA)

**PORT 3850. Independent Study.** [Formerly PORT 289] A reading course, the content of which varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available to the student in the regular courses of the curriculum. [Variable credit: 1-3 hours, not to exceed 12 over a four-semester period] (No AXLE credit)

**PORT 3891. Special Topics in Portuguese and Brazilian Literature or Civilization in English Translation.** [Formerly PORT 295] Does not

count toward a major or minor in Portuguese. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**PORT 3892. Special Topics in Portuguese Language, Literature, or Civilization.** [Formerly PORT 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3303. [3] (No AXLE credit)

**PORT 4350. Brazilian Culture through Native Material.** [Formerly PORT 225] Differences between spoken and written Portuguese in Brazil. Modern culture, including popular music, film, politics, family life, and sports. Prerequisite: 3301 or 3302. [3] (P)

**PORT 4420. Brazilian Literature through the Nineteenth Century.** [Formerly PORT 232] Main literary trends, principal writers and works of Brazilian literature, from colonial beginnings through the nineteenth century. Study of the works of Gregório de Matos, Gonçalves Dias, Alencar, Machado de Assis, and Euclides da Cunha. Prerequisite: 3303. [3] (HCA)

**PORT 4425. Modern Brazilian Literature.** [Formerly PORT 233] Brazilian literature from the Semana de Arte Moderna to the present. Modernist and neo-Modernist movements. Prerequisite: 3303. [3] (HCA)

## Psychology

**PSY 1001. Commons Seminar.** [Formerly PSY 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**PSY 1111. First-Year Writing Seminar.** [Formerly PSY 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**PSY 1200. General Psychology.** [Formerly PSY 101] A survey of modern scientific psychology. Topics include development, perception, motivation, learning, thinking, remembering, emotion, intelligence, special aptitudes, and personality development. General applications to human behavior. The student must either analyze published research or be a subject in current research. No credit for students who have earned credit for 1111 sections 1, 2, or 3. [3] (SBS)

**PSY 2100. Quantitative Methods.** [Formerly PSY 209] Principles and methods for the statistical analysis of experiments, with emphasis on applications in psychology. Descriptive and inferential statistics. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

**PSY 2150. Principles of Experimental Design.** [Formerly PSY 208] Theory and research methods in psychological science. Philosophy of science, ethical issues, experimental design, and data interpretation. Prerequisite: 2100 or PSY-PC 2110. [3] (SBS)

**PSY 3100. Abnormal Psychology.** [Formerly PSY 215] Mental and emotional disorders. Definitions of adequate human functioning processes that disrupt functioning. Methods of evaluation and treatment. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3110. Social Psychology.** [Formerly PSY 231] The influence of social conditions upon behavior in interpersonal and group relations. Perception, judgment, learning, and attitudes. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3120. Cognitive Psychology.** [Formerly PSY 225] Attention, pattern recognition, knowledge representation, language, reasoning, and human intelligence. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3600. Personality.** [Formerly PSY 211] Major theories of personality development, methods of assessment, and results of research, with an em-

phasis on normal behavior. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3605. Industrial and Organizational Psychology.** [Formerly PSY 239] Scientific theories in cognitive, social, and personality psychology to improve work motivation and performance. Job analysis and assessment methods. Leadership, teamwork, and cross-cultural issues. Prerequisite: 1111 section 1, 2, or 3, or 1200; or a major in Cognitive Studies, Child Development, or Child Studies. [3] (SBS)

**PSY 3610. Introduction to Clinical Psychology.** [Formerly PSY 244] Historical foundations, professional ethics, principles of clinical assessment and therapy, and areas of specialization such as health psychology. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3615. Emotion.** [Formerly PSY 245] Definitions and functions of emotion. Emotion and health, emotion and psychopathology, individual differences, and emotional development. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3620. Schizophrenia.** [Formerly PSY 246] Neurological, psychological, cultural, and evolutionary perspectives. Genetics, epidemiology, symptomatology, sex differences, and affect. Prerequisite: 3100 and NSC 2201. [3] (SBS)

**PSY 3625. Depression.** [Formerly PSY 247] Psychological and biological perspectives on unipolar and bipolar affective disorders. Assessment and classification, epidemiology, genetics, family environment, and treatments. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3630. Drugs and Behavior.** [Formerly PSY 261] Drug effects on neural circuits, human physiology, individual psychology, and society. No credit for students who have earned credit for NSC 3260. Prerequisite: 1200 or NSC 2201. [3] (SBS)

**PSY 3635. Health Psychology.** [Formerly PSY 268] Neurophysiological, endocrine, and immune systems. Factors underlying health habits and lifestyles. Methods to enhance health behaviors and prevent illness. Stress management. Reciprocal interactions among behavior, thoughts, and physiology with resulting effects on physical and psychological health and illness. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3640. Positive Psychology.** [Formerly PSY 270] Optimal functioning in human psychology. Interdisciplinary approaches to well being, character strengths and virtues, positive emotions, and clinical implications. No credit for students who have earned credit for PSY 1111 section 13. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3700. Movement.** [Formerly PSY 216] Psychological, computational, and neural perspectives on the activities of looking, reaching, grasping, speaking, smiling or frowning, walking and running. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

**PSY 3705. Human Sexuality.** [Formerly PSY 252] The physiological, psychological, and cultural bases of sexual behavior. History of sexuality, gender roles, sex in human relationships, diagnosis and treatment of sexual disorders and dysfunctions, cross-cultural perspectives, pornography, rape, AIDS, and homosexuality. [3] (P)

**PSY 3715. Animal Behavior and Evolutionary Psychology.** [Formerly PSY 258] Comparative and phylogenetic approach to the study of behavior, with special emphasis on sensory processes, instinctive behavior, the genetics of behavior, and ethology. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3750. Perception.** [Formerly PSY 214] Current theory and research in sensation and perception, including an analysis of philosophical and biological issues. Biological organisms' acquisition, processing, and use of information about objects and events in the environment. Vision, audition, taste, smell, and touch. Prerequisite: NSC 2201 and either PSY 1111

section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

**PSY 3755. Behavioral Decision-making.** [Formerly PSY 226] Affective, cognitive, and motivational processes involved in human judgment and decision-making. Accurate and inaccurate judgments; optimal and sub-optimal decisions. Offered on a graded basis only. Prerequisites: 2100 (or PSY-PC 2110) and 2150. [3] (MNS)

**PSY 3760. Mind and Brain.** [Formerly PSY 232] Concepts of cognitive neuroscience. Relationship between the brain and perception, cognition, attention, memory, language, thought, emotion, social judgments, and consciousness. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

**PSY 3765. Social Cognition and Neuroscience.** [Formerly PSY 238] Neural underpinnings of social perceptions, evaluations, and decisions. Face perception, attraction and reward processing, social co-operation and competition, decision-making, and moral judgments. Offered on a graded basis only. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3775. Human Memory.** [Formerly PSY 253] Single- and dual-process models of recognition memory; context and the role of time in memory search; interference versus decay in theories of forgetting. Theories of association, memory for sequences, and memory disorders. [3] (MNS)

**PSY 3780. The Visual System.** [Formerly PSY 236] Interdisciplinary approach to the ways that humans see and interpret their visual environment. Structure of the eye and brain, including optics. Physiology of individual cells and groups of cells. Machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

**PSY 3785. Brain Damage and Cognition.** [Formerly PSY 277] Effects of neurological impairment from stroke, injury, or disease on perception, speech, memory, judgment, and behavior. Relationship between brain systems and cognitive systems. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

**PSY 3840. Directed Study.** [Formerly PSY 290] Participation in ongoing research projects under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Open only to juniors and seniors. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [1-3] (No AXLE credit)

**PSY 3850. Independent Study.** [Formerly PSY 293] Development of a project by the individual student under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Open only to juniors and seniors. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [1-3] (No AXLE credit)

**PSY 3890. Special Topics in Perception.** [Formerly PSY 280] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3750. [3] (No AXLE credit)

**PSY 3891. Special Topics in Cognitive Psychology.** [Formerly PSY 282] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3120. [3] (No AXLE credit)

**PSY 3892. Special Topics in Neuroscience.** [Formerly PSY 285] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: NSC 2201. [3] (No AXLE credit)

**PSY 3893. Special Topics in Clinical Psychology.** [Formerly PSY 288] May be repeated for credit more than once if there is no duplication in

topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3100. [3] (No AXLE credit)

**PSY 3894. Special Topics in Social Psychology.** [Formerly PSY 289] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3110. [3] (No AXLE credit)

**PSY 3980. Honors Seminar.** [Formerly PSY 295A] Individual readings, reports, and seminar discussions of the basic areas of psychology. Selection of topics will provide some freedom to pursue individual interests. Open only to departmental honors candidates. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (No AXLE credit)

**PSY 3981. Honors Seminar.** [Formerly PSY 295B] Individual readings, reports, and seminar discussions of the basic areas of psychology. Selection of topics will provide some freedom to pursue individual interests. Open only to departmental honors candidates. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (No AXLE credit)

**PSY 4720. Experimental Methods in Behavioral Neuroscience.** [Formerly PSY 234] Experimental methods in behavioral neuroscience. Computer-based data acquisition and analysis, statistical reasoning, and manuscript preparation. Prerequisite: 1200 and NSC 2201. [3] (MNS)

**PSY 4998. Honors Thesis.** [Formerly PSY 296A] Participation with a staff member in work leading toward the senior thesis. This work may consist of readings and reports or active participation in research and will culminate in an independent research report. Open only to departmental honors candidates. Prerequisite: 3980 or 3981. [3] (No AXLE credit)

**PSY 4999. Honors Thesis.** [Formerly PSY 296B] Participation with a staff member in work leading toward the senior thesis. This work may consist of readings and reports or active participation in research and will culminate in an independent research report. Open only to departmental honors candidates. Prerequisite: 3980 or 3981. [3] (No AXLE credit)

## Public Policy Studies

**PPS 1001. Commons Seminar.** [Formerly PPS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**PPS 3890. Special Topics.** [Formerly PPS 294] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**PPS 4960. Senior Seminar on Research in Public Policy.** [Formerly PPS 295] Supervised research project in policy area incorporating methodologies and analytical insights from more than one discipline. Offered on a graded basis only. [3] (SBS)

## Religious Studies

**RLST 1001. Commons Seminar.** [Formerly RLST 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**RLST 1010. Encountering Religious Diversity.** [Formerly RLST 101] Essential beliefs and practices of the world's major religious traditions. Hinduism, Buddhism, Judaism, Christianity, and Islam. Contemporary scholarship and perspectives on religious encounters from each of these traditions. [3] (HCA)

**RLST 1100. Introduction to African American Religious Traditions.** [Formerly RLST 107] Historical survey of the leadership, dynamics, and cultural milieu of African American religious traditions. Institutional expressions and theologies from the colonial period to the present. [3] (US)

**RLST 1111. First-Year Writing Seminar.** [Formerly RLST 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in

any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**RLST 1190W. Introduction to Southern Religion and Culture.** [Formerly RLST 110W] An exploration of the histories of evangelical and non-evangelical expressions in Southern religious culture from the colonial period to the present. The evangelical thrust of Southern culture, with some attention to Catholicism, Judaism, and other religious modes considered outside the mainstream of that culture. [3] (SBS)

**RLST 1200. Introduction to Judaism.** [Formerly RLST 112] Comprehensive historical overview of Judaism as a religion and a culture. The main ideas and institutions of Judaism, the centrality of the Hebrew Bible and the meaning of interpretation, thinkers, and movements in Jewish civilization, from rabbinic Judaism, medieval philosophy, mysticism, to modern thought, Zionism, and the foundation of the State of Israel. Recent Jewish self-representation in art. [3] (HCA)

**RLST 1208. Themes in the Hebrew Bible.** [Formerly RLST 108] A thematic introduction to the Hebrew Scripture/Old Testament. Selected themes – such as creation, revelation, covenant, law, suffering, messianic expectation – are traced through the diverse parts of the Bible (Pentateuch, Prophetic Writings, and Wisdom Literature) as well as in early Jewish texts. The comparison of the various expressions of these themes shows both the distinctiveness of each document and the continuity of the Biblical faith through the centuries. [3] (HCA)

**RLST 1309. Themes in the New Testament.** [Formerly RLST 109] A comparative study of New Testament documents following central themes – such as salvation; evil and sin; the roles of Christ, God, and the Spirit; discipleship; the church; sacred history. The distinctive teaching of each New Testament document as related to a concrete historical setting. Comparison with similar themes in Jewish and Hellenistic texts of that period. [3] (HCA)

**RLST 1330W. The Gnostic Gospels.** [Formerly RLST 111W] Gnostic writings of the 2nd-4th centuries; relationship to other early Christian writings; modern views of Gnosticism. [3] (HCA)

**RLST 1500. Introduction to Islam.** [Formerly RLST 113] An historical overview of the different religious traditions in Islam, their basis in the Qur'an and life of the Prophet, their proliferation in the medieval period, and their response to the challenge of modernity. Topics include sunni and shii' Islam, evolution of law and theology, sufism and political philosophy. Islam in Africa, India, Spain, and southeast Asia as well as the Middle East. [3] (HCA)

**RLST 1637. Religions of Tibet and the Himalaya.** [Formerly RLST 137] Sixth century CE to the present. Religious ideas and practices. Myth, cosmology, doctrine, pilgrimage, and ritual. Adaptation of religious tradition to changing historical and cultural contexts. Encounters among Tibetan Buddhism, Bön, Catholicism, and modernity. [3] (INT)

**RLST 1700. Religions in China.** [Formerly RLST 135] Major religious traditions of China. Taoism, Buddhism, Confucianism, state-sponsored religious systems, and popular religion. Thought and practice from ancient times to the present. [3] (INT)

**RLST 1710. Religions of Japan.** [Formerly RLST 136] Early myths to present-day practices. Buddhism, Shinto, Shugendō, Christianity, and new religious movements. Cosmology, ritual, death, and modernity. Thematic explorations through film. [3] (INT)

**RLST 1820. Religion, Sexuality, Power.** [Formerly RLST 120] Historical, cultural, social scientific, and philosophical theories of how religious and political ideas and institutions are related to and dependent upon assumptions and ideologies of sex, gender, and race. Politics and public discourse on sex and religion. [3] (SBS)

**RLST 2210W. Constructions of Jewish Identity in the Modern World.** [Formerly RLST 220W] How Jewish thinkers at the end of the nineteenth and early twentieth centuries addressed the question of individual and collective identity. Cultural, political, and religious definitions of modern Jewish identity, the role and the reinvention of national myths; the "Jewry of muscles," the "New Hebrews," the Zionist myth narratives in Zionism. [3] (HCA)

**RLST 2220. Jewish Ethics.** [Formerly RLST 222] A study of the logic and basic values that, in the Jewish tradition, guide thinking about moral

problems. Examination of family and social ethical issues found in Talmud and other Jewish classical texts. Basic religious views of modern Jewish thinkers and their relation to contemporary Jewish life. Offered alternately with 1200. [3] (HCA)

**RLST 2310. Interpreting the Gospels.** [Formerly RLST 210] The Synoptic Gospels through history and culture. Focus on either Matthew, Mark, or Luke; a survey of the interpretations of the Gospel from its original historical context, through the history of the church, and more recently in Catholic and Protestant churches after the Holocaust, in African American churches, and in feminist circles. [3] (HCA)

**RLST 2461. Islam in Africa.** [Formerly RLST 261] Social and cultural development of Islam across Africa from the eighth century to the present, as illuminated by historical, ethnographic, and literary sources. Interplay between Muslims and outside religious groups, jihads in pre-colonial Africa, and Islam during European colonization. Attention to Sub-Saharan Africa. [3] (INT)

**RLST 2471. Religion in Africa.** [Formerly RLST 171] Indigenous religious forms from pre-colonial Africa to the present. Creation myths, notions about gods and spirits, ritual, magic, witchcraft, art, shamanism, and ancestry. Interplay of indigenous religions with Islam and Christianity. No credit for students who earned credit for 294 section 2 in fall 2013. [3] (INT)

**RLST 2472. Religion, Ecology, and Power in Africa.** [Formerly RLST 272] The interrelationship between religion and ecology in Africa; the ways power relations in pre-colonial Africa through the present have determined human-Earth relations. Divine origin and development of the Earth and its peoples; influence on African social structure, ethnically-based occupations, and stewardship over the environment. [3] (INT)

**RLST 2644. Buddhist Traditions.** [Formerly RLST 244] Historical and thematic survey of foundational, Mahayana, and esoteric Buddhist traditions. Mythology, doctrine, meditation, devotional practices, and institutions of early and medieval South Asia. Contemporary case studies from Asia and North America. [3] (INT)

**RLST 2664. Foundations of Hindu Traditions.** [Formerly RLST 264] Hindu cosmology and the ritual structure of sacrifice. The effect of the law of cause and effect (karma) on the moral order of the universe (dharma). The emergence of bhakti devotion to key gods and goddesses. The escape from the cycle of lives through yoga, introspection, and devotion. Pilgrimage mapping and the sacred geography of ancient and modern India. Classical mythology of the Vedas, Epics, and Puranas. [3] (INT)

**RLST 2811. Natural Science and the Religious Life.** How scientific discoveries and religious teachings are related. Descriptions of the physical universe from Aristotle through Albert Einstein are compared to contemporaneous definitions of the moral life by religious thinkers such as Thomas Aquinas, Martin Luther, Immanuel Kant, and Martin Buber. [3] (P)

**RLST 2881. Myth and History in Religious Biography.** [Formerly RLST 181] Religious biography and hagiography as distinct literary genres. Hero mythology and narrative patterning. Ways religions construct unique biographical images by combining the historical life with religious belief. Examples from lives of Jesus, Buddha, Muhammad, Luther, Caitanya, Shintan, and Mama Lola. Interpretive strategies include hermeneutic theory, modes of history, structuralism, and feminism; additional theoretical perspectives on translation, orality, and reader response criticism. [3] (HCA)

**RLST 2940. Great Books of Literature and Religion.** [Formerly RLST 140] "Great Books" of the Western intellectual tradition, tracing Greco-Roman and Judeo-Christian literature and culture from their origins to synthesis in the medieval period. [3] (HCA)

**RLST 3079. The Sacred and the Secular.** [Formerly RLST 279] Ethnographies of ritual and religious life. Politics of secularism and religious revival. Issues in anthropology, literature, and philosophy. Christianity, Hinduism, Islam, and Native American Religions. [3] (P)

**RLST 3119. Martin Luther King, Jr., and the Social Roles of Religion.** [Formerly RLST 219] King as religious leader and agent of social change. His views of the social roles of religion seen against the background of late nineteenth-century dissenting traditions and the early twentieth-century

social gospel movement in America. Critical evaluations in terms of classical Christian views (e.g., Aquinas, Luther, Calvin, Wesley). [3] (US)

**RLST 3142. Slave Thought and Culture in the American South.** [Formerly RLST 242] The religious thought of African American slaves as expressed through folklore, literature, and art. Creative ideas about the cosmos, the supernatural, transcendent spiritual reality, natural social reality, and the human condition. Offered on a graded basis only. [3] (US)

**RLST 3178. Native American Religious Traditions.** [Formerly RLST 278] Diversity of First Nation religious traditions in North America, especially Eastern Woodlands and Plains. Spiritual and cultural dimensions of diversity, cosmologies, stereotypes, cultural resilience, creativity and storytelling, humor, rituals and practices, healing, and sovereignty. [3] (HCA)

**RLST 3225. Sexuality in the Hebrew Bible and the Ancient Near East.** [Formerly RLST 225] Issues of sexuality in the Hebrew Bible in the context of the Ancient Near East. Homosexuality, virginity, and incest. [3] (HCA)

**RLST 3229. The Holocaust: Its Meanings and Implications.** [Formerly RLST 229] Interdisciplinary study of the systematic destruction of European Jewish communities during WWII. Historical, social, political, cultural developments that led to it. Psychological and sociological dimensions of its aftermath. Philosophical and theological problems it raises for both Jews and Christians. No credit for students who earned credit for JS 156 in fall 2013. [3] (P)

**RLST 3270. Jewish Theories of Religion.** [Formerly RLST 203] Critical analysis and discussion of modern Jewish constructions of religion: politically, symbolically, ethically, normatively, and aesthetic-mystically. Selected readings from Cohen, Buber, Rosenzweig, Kaplan, and social philosophers such as Simmel and Habermas on the function, nature, and meaning of religion in secular culture. [3] (P)

**RLST 3304W. Evangelical Protestantism and the Culture Wars.** [Formerly RLST 204W] Evangelical traditions from the reformation to their present manifestations in twentieth-century America. Debates concerning the authority of the scripture, the person of Jesus Christ, evangelism, and soul-winning mission, revivalism and social reform, church-state relations, the relationship between science and religion, Biblical vs. "New" morality, and other areas of cultural cleavage. [3] (US)

**RLST 3306. Global Interpretations of Christian Scriptures.** [Formerly RLST 206] Comparative interpretations of Biblical texts by Christians in Africa, Asia, Latin America, and Oceania - with those by Orthodox Christians in Eastern Europe and the Middle East, and by Catholics and Protestants in Western Europe and North America. The role of culture in each type of biblical interpretation. [3] (INT)

**RLST 3312. The Pauline Interpretation of Christianity.** [Formerly RLST 212] An introduction to Pauline Christianity and its place in the early church, using the letters of Paul, the deutero-Pauline letters, and the portrait of Paul in Acts. [3] (HCA)

**RLST 3313. Ethics of the New Testament.** [Formerly RLST 213] Major ethical teachings as presented in New Testament documents, letters, and as interpreted through history and cultures. [3] (HCA)

**RLST 3316. Christianity in the Reformation Era.** [Formerly RLST 216] The setting of the Reformation (c. 1500-1648) and its developments together with consideration of some of the significant ecclesiastical, theological, and historical issues of the period. Attention to backgrounds and causes and examination of major individuals and ecclesiastical patterns. The aim of the course is to help students understand and interpret the events, become familiar with some of the major theological documents, and reflect upon questions of continuing historical interest that have come out of the Reformation. [3] (HCA)

**RLST 3380. History Christian Tradition.** [Formerly RLST 180] Christian traditions from the origins to the present. Such themes as Christology, church and state, and the social and cultural contents of changing Christian beliefs, and views of the Church. [3] (HCA)

**RLST 3561. Islam in South Asia.** History of Islam in South Asia. Cultural memory of conquest. Inter-religious interactions. Sufism and Bhakti. Mu-

ghal traditions of cosmopolitanism. Legacy of colonialism. Impact of Partition. Shared popular culture and shared sacred spaces. [3] (INT)

**RLST 3650. Classical Philosophies of India.** [Formerly RLST 250] Hindu and Buddhist traditions. The six "mainstream" schools (darsana) of Hindu thought and their interaction with Buddhist philosophy in ancient India. [3] (INT)

**RLST 3669. Sacred Space in the Tibetan World.** [Formerly RLST 269] Creation, mediation, and reproduction of sacred space from artifacts to built structures to geographies. Narrative, ritual, and cosmological aspects of Tibetan Buddhist, Bön, and local religious traditions. Cases include pre-modern to modern periods, and local to global contexts. [3] (INT)

**RLST 3670W. Buddhism and the State.** [Formerly RLST 270W] Models relating Buddhism and the state in ancient and modern Asia. Kingship and spiritual leadership; sacred territory and national identity; legitimation theory and its alternatives; and religious responses to the modern state. Case studies from India, Nepal, Thailand, Burma, Tibet, Mongolia, China, and Japan. [3] (INT)

**RLST 3747. Daoist Tradition.** [Formerly RLST 247] Historical and thematic survey of the Daoist tradition in China. Philosophical classics and religious scriptures, as well as social history are covered. Daoism today. [3] (HCA)

**RLST 3749. Zen Buddhism.** [Formerly RLST 249] A study of the development of Zen Buddhism in China and Japan with special attention to its basic philosophy, its position within Mahayana Buddhism, its meditational techniques, and its contemporary significance. [3] (INT)

**RLST 3753. East Asian Buddhism.** [Formerly RLST 253] East Asian Buddhist texts. Key Buddhist ideas, values, practices, and institutions. Chronological surveys of key developments in major historical periods. [3] (INT)

**RLST 3775. Chinese Religions through Stories.** [Formerly RLST 275] Analysis of narratives from various religious traditions and genres within early and medieval China. The role of narrative in Chinese religious, cultural, and political life. Primary texts in English translation. Offered on a graded basis only. [3] (INT)

**RLST 3850. Independent Study.** [Formerly RLST 289A] May be repeated for a total of 6 credits in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of RLST 3850 and 3851] (No AXLE credit)

**RLST 3851. Independent Study.** [Formerly RLST 289B] May be repeated for a total of 6 credits in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of RLST 3850 and 3851] (No AXLE credit)

**RLST 3890. Special Topics in Religious Studies.** [Formerly RLST 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**RLST 3900. Mysticism and Spirituality, Comparative Study.** [Formerly RLST 200] Philosophical, historical, and textual perspectives. Key mystical traditions, philosophies, texts, and figures from Hindu, Buddhist, and Christian traditions. The popular emergence of spirituality as a contemporary mode of religiosity in advanced capitalist societies. [3] (P)

**RLST 3921. Ethics and Ecology.** [Formerly RLST 221] Relationships among humans, nature, and the sacred. Focus on understandings of our 'dominion' over non-human nature. The role of religion in shaping attitudes and behaviors regarding the environment. Topics include eco-centered ethics, 'creation care,' reliance on fossil fuels, and alternative sustainable scenarios. [3] (SBS)

**RLST 3926. Ancient Goddesses.** [Formerly RLST 226] Ancient concepts of the feminine divine in literature and iconographic evidence. Specific goddesses, their spheres of influence, and their place in the various pantheons. Cultic practices and religious syncretism across cultures,



including Mesopotamia, Egypt, and Ancient Israel. Offered on a graded basis only. [3] (INT)

**RLST 3930. Women and Religion.** [Formerly RLST 230] Themes and issues in the traditions and texts of selected Western religions from a feminist perspective. Biblical and theological images of women, sources of religious authority, psychological and ethical implications of feminist approaches to religion. [3] (P)

**RLST 3940. The Nature of Evil.** [Formerly RLST 240] Human evil as expressed in the Shoah, religious fundamentalism, and ethnic cleansing. Theological, philosophical, biological, and literary texts. Evil transformed by scientific inquiry since 1600. [3] (HCA)

**RLST 3941. Religion, Science, and Evolution.** [Formerly RLST 241] Interactions between science and religion from antiquity to Charles Darwin. Subsequent modifications of Darwinism and religious responsibilities to evolutionary theories. [3] (SBS)

**RLST 4100. Native American Philosophies.** Shared concepts and principles among contemporary Native American writers. Time, space, personhood, ecology, and healing. Spirituality and narrative ontology. [3] (HCA)

**RLST 4551. Islamic Mysticism.** [Formerly RLST 251] Origins and development of mystical traditions in Islam; rise of asceticism; early Sufis; development and systematization of Sufi orders and teachings; evolution of theosophical dimensions of mysticism; present day Sufism and its spread in North America; comparison of Islamic mysticism with other forms of mysticism. [3] (HCA)

**RLST 4552. Islam in the Modern World.** [Formerly RLST 252] Impact of colonialism on Muslim societies and everyday life in the cities of the Middle East. Analysis through literary, religious, political, and ethnographic texts. Relationship of Sharia to the modern state; impact of modernity on the understanding and practice of religion. [3] (INT)

**RLST 4554. The Qur'an and Its Interpreters.** [Formerly RLST 254] The Qur'an and the Islamic tradition of interpretation. The treatment of Biblical prophets, Jesus and Satan. Interpretations will be drawn from all time periods including rationalist, dogmatic, Shi'i and mystical schools of interpretation. [3] (INT)

**RLST 4562. Culture, Religion, and Politics of the Arab World.** [Formerly RLST 262] Diversity and unity in Arab culture. Religious, sociopolitical, and historical factors shaping Arab identity in the modern age. Encounters and relationships between Arabs and the Western world. The Israeli-Palestinian conflict. Serves as repeat credit for students who completed 294 section 1 in summer 2008, summer 2009, or summer 2010. [3] (INT)

**RLST 4592. Advanced Seminar in Arabic.** [Formerly RLST 292] Analysis of style and forms. Poetry, novels, popular literature, and historical chronicles. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**RLST 4593. Advanced Seminar in Islamic Tradition.** [Formerly RLST 293] Analysis of original Arabic texts, manuscript reading, and research methods. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**RLST 4665. Mythologies and Epics of South Asia.** [Formerly RLST 265] Classical Hindu and Buddhist mythologies of South Asia. Sanskrit Mahabharata and Ramayana epics. Regional adaptations of mythical themes in vernacular languages. Buddhist and Islamic narratives of romance and chronicle. Interpretive and performance strategies. Oral, literary, and visual modes of representation. Political deployment of myths. [3] (INT)

**RLST 4666. Devotional Traditions of South Asia: Hindu, Muslim, Sikh.** [Formerly RLST 266] Mythology of Hindu pantheon and worship through devotion or bhakti. Techniques for inculcating devotion through meditation, temple rituals, and pilgrimage. Entry of Islam into South Asia. Shi'i and Sufi practices. Sikh traditions. Role of vernacular languages in creating local traditions. Hindu-Muslim interaction, syncretism, and shared sacred space. Challenges to orthodoxy. [3] (INT)

**RLST 4774. Japanese Mythology.** [Formerly RLST 274] Antiquity to the present. Classic myths and re-tellings over time. Introduction to theoretical frameworks including comparative and historical. Politics, gender, and performance. [3] (INT)

**RLST 4834. Post-Freudian Theories and Religion.** [Formerly RLST 234] An examination of contemporary European and American schools of psychoanalysis. Focus on both the clinical and explanatory theories as they relate to the examination of religious experience. Recommended: 1820 or 121. [3] (SBS)

**RLST 4835. Freudian Theories and Religion.** [Formerly RLST 235] A critical assessment of psychoanalytic theories as an explanation of religious behavior. Study of the basic structure of these theories followed by a systematic critique of texts by Sigmund Freud and Erik Erikson. Examination of religious narrative forms. [3] (SBS)

**RLST 4836. The Religious Self according to Jung.** [Formerly RLST 236] The religious core of human existence as related to the concepts of the archaic unconscious and the birth of the self in C. G. Jung's analytical psychology. Study of the life and thought of Jung as illustrated by his autobiography, *Memories, Dreams, Reflections*. Critical assessment of his theory as a means for understanding religious phenomena. [3] (SBS)

**RLST 4837. Psychology of Religious Myth and Ritual.** [Formerly RLST 237] Examination of religious rituals and myths from both Christian and other traditions. Critical review of major psychological theories of ritual and myth. Their relevance to an understanding of myth and ritual as religious phenomena. [3] (SBS)

**RLST 4938. Marriage in the Ancient Near East and the Hebrew Bible.** [Formerly RLST 238] Religious, legal, and socio-economic aspects of marriage. Survey of ancient Sumerian, Assyrian, Babylonian, and Egyptian sources, and relevant sections of the Hebrew Bible. Marriage as an institution at the beginning of recorded history. [3] (INT)

**RLST 4939. Religious Autobiography.** [Formerly RLST 239] The construction of identity in religious autobiography: motivations (personal salvation, witness, proselytism); relationships among self, God, and religious tradition; role of memory; cultural, gender, and religious differences. Readings may include Augustine, Gandhi, Malcolm X, Angelou, Wiesel. [3] (P)

**RLST 4960W. Approaches to the Academic Study of Religion.** [Formerly RLST 280W] Theories and methods for the academic study of religious traditions. Open only to junior and senior majors and minors. [3] (HCA)

**RLST 4970. Majors Colloquium.** [Formerly RLST 298] Regular presentations and critical readings of student projects and professional writings. May be repeated for credit twice for a total of 3 credit hours. Open only to majors. [1] (No AXLE credit)

**RLST 4998. Senior Honors Thesis.** [Formerly RLST 299A] Reading of primary research sources and writing an honors thesis under the supervision of the thesis adviser. Open only to senior departmental honors students. [3] (No AXLE credit)

**RLST 4999. Senior Honors Thesis.** [Formerly RLST 299B] Reading of primary research sources and writing an honors thesis under the supervision of the thesis adviser. Open only to senior departmental honors students. [3] (No AXLE credit)

## Russian

**RUSS 1001. Commons Seminar.** [Formerly RUSS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**RUSS 1101. First-Year Russian.** [Formerly RUSS 101] Elementary conversation and reading with an emphasis on everyday situations. An introduction to Russian culture and life through contemporary Russian materials. Five hours of class work. No credit for students who have earned credit for a more advanced Russian language course. [5] (No AXLE credit)

**RUSS 1102. First-Year Russian.** [Formerly RUSS 102] Continuation of 1101 with emphasis on reading and talking about texts. No credit for students who have earned credit for a more advanced Russian language course. Prerequisite: 1101. [5] (INT)

**RUSS 1111. First-Year Writing Seminar.** [Formerly RUSS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**RUSS 1874. Russian Fairy Tales.** [Formerly RUSS 183] Perspectives from history, psychology, politics, gender, and religion. Fairy tale adaptations by Pushkin, Tolstoy, Stravinsky, Nabokov, Bulgakov, and others. Knowledge of Russian is not required. [3] (INT)

**RUSS 1910W. 19th Century Russian Literature.** Literature as a battleground for the conflict between traditional values and new, rationalistic values introduced by industrialization and modernization. Gender relations, role of religion, social status of art, and rise of radical political movements. Texts by Tolstoy, Dostoevsky, and Chekhov. Knowledge of Russian not required. No credit for students who earned credit for 2310. [3] (HCA)

**RUSS 1911W. 20th Century Russian Literature.** Masterpieces of literature as reflections of and reactions to massive social and political changes. Utopian and dystopian writing; literature as investigative reporting; and sincerity vs. postmodern irony. Return to nationalism in Putin's Russia. Including writings by Nabokov and six Nobel laureates: Bunin, Pasternak, Sholokhov, Solzhenitsyn, Brodsky, and Alexievich. Soviet and contemporary genre fiction. Knowledge of Russian is not required. [3] (HCA)

**RUSS 2201. Second-Year Russian I.** [Formerly RUSS 203] Reading, speaking, listening, and writing. Grammar review and reading of contemporary Russian texts. No credit for students who have earned credit for 2211 {205} or 2212 {206}. Prerequisite: 1102. [4] (INT)

**RUSS 2202. Second-Year Russian II.** [Formerly RUSS 204] Reading, speaking, listening, and writing. Grammar review and reading of contemporary Russian texts. No credit for students who have earned credit for 2211 {205} or 2212 {206}. Prerequisite: 2201. [4] (INT)

**RUSS 2210. Russia Today: Politics, Economics, and Culture.** [Formerly RUSS 251] Four-week immersion in the history and culture of Russia. Travel to and interaction with residents in Vladimir, Moscow, St. Petersburg, and rural areas. Excursions to UNESCO World Heritage sites and volunteering at community organizations. Pre-departure readings and an examination must be completed. Knowledge of Russian is not required. [3] (INT)

**RUSS 2230. Russia at War.** [Formerly RUSS 230] Russia's wars as seen through depictions in literature, film, music, and video games. Works by Tolstoy, Eisenstein, Bulgakov, Babel, Borodin, and others. Knowledge of Russian not required. [3] (INT)

**RUSS 2273. Russian Science Fiction.** [Formerly RUSS 173] Masterpieces of the genre including Tarkovsky's *Solaris* and *Stalker*, the novels of the Strugatsky Brothers, and Protazanov's *Aelita*. Various media ranging from literature and film to video games. Knowledge of Russian not required. [3] (INT)

**RUSS 2434. Russian Cinema.** [Formerly RUSS 234] Masterpieces of Russian and Soviet cinema from the silent period to the present. Montage theory, propaganda film, politics of the art house, and rise of the Russian blockbuster. Films by master directors Eisenstein, Vertov, Tarkovsky, Sokurov, and Zvyagintsev. Soviet musicals and contemporary popular cinema. Knowledge of Russian not required. [3] (INT)

**RUSS 2435. Leo Tolstoy: *Anna Karenina* and Other Masterpieces.** [Formerly RUSS 235] Early stories and post-conversion novellas. Realist masterpiece *Anna Karenina* and its film adaptations. Moral inquiry in Tolstoy's writing. Philosophical and psychological exploration into the themes of love, adultery, religion, work, and art. Knowledge of Russian is not required. [3] (INT)

**RUSS 2438. Dostoevsky's Major Novels: Philosophy and Aesthetics.** [Formerly RUSS 238] Major prose works in historical and social context, including *The Notes from the Underground* and *The Brothers Karamazov*. Influence on twentieth-century philosophy. Critical responses from other

writers and philosophers of the nineteenth and twentieth centuries. Taught in English with texts in English translation. [3] (INT)

**RUSS 2485. Russian Crime Fiction.** Dostoevsky, Tolstoy, Nabokov, and others. Contemporary Russian interpretations of Sherlock Holmes and of classic Russian crime cinema. Knowledge of Russian is not required. [3] (INT)

**RUSS 2537. Vladimir Nabokov.** [Formerly RUSS 237] Major works including *The Luzhin Defense*, *Lolita*, *Invitation of a Small Animal*, and *Pale Fire*. Examination of Nabokov's life through his memoir, *Invitation of a Small Animal*, and excerpts from his unfinished final novel, *The Eye*. Knowledge of Russian is not required. [3] (INT)

**RUSS 2639. From the House of the Dead: Stories of Siberia.** Depictions of Siberia from Russian and outside perspectives. Exile, imperial conquests, the Stalinist gulag, and native Siberian cultures. Works on Siberia by Dostoevsky, Tolstoy, Chekhov, Solzhenitsyn, Shostakovich, Kurosawa, and Herzog. Pasternak's Siberia-themed masterpiece *Doctor Zhivago* and writings by native Siberians. Knowledge of Russian not required. [3] (INT)

**RUSS 2645. Modernity and its Discontents: Russian and Brazilian Literature and Film.** From the 1850s to the present. Rise of modernity in St. Petersburg and Rio de Janeiro (Dostoevsky, Machado de Assis). Modern civilization and violence through war and the prison camp experience. Cinema and political utopia; and contemporary cinema. Knowledge of Russian is not required. [3] (INT)

**RUSS 2745. Art After Zero: The Russian Avant-Garde.** Creation out of nothing (ex nihilo). Various media, 1910s-1930s. Works by Kandinsky, Pasternak, Stravinsky, Prokofiev, Shostakovich, Eisenstein, and Vertov. Knowledge of Russian is not required. [3] (INT)

**RUSS 3303. Advanced Grammar and Reading.** Advanced grammar and reading skills. May be repeated once for credit. Prerequisite: 2202. [4] (INT)

**RUSS 3305. Advanced Conversation and Composition.** [Formerly RUSS 257] Advanced conversation and composition skills. May be repeated once for credit. Prerequisite: 2202. [4] (INT)

**RUSS 3850. Independent Readings.** [Formerly RUSS 289A] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for four semesters of RUSS 3850 and 3851] (No AXLE credit)

**RUSS 3851. Independent Readings.** [Formerly RUSS 289B] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for four semesters of RUSS 3850 and 3851] (No AXLE credit)

**RUSS 3880. Internship Training.** [Formerly RUSS 280A] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Russia. Background reading and research must be completed in Russian 3881 concurrently with 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average and prior approval of the director of undergraduate studies of the student's plans are required. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 cannot be included in the minimum hours counted toward the Russian majors or minors. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

**RUSS 3881. Internship Readings and Research.** [Formerly RUSS 280B] Under faculty supervision, students gain experience working in a

variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Russia. Background reading and research in Russian 3881 must be completed concurrently with 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average and prior approval of the director of undergraduate studies of the student's plans are required. Corequisite: 3880. [Variable credit: 3-6] (No AXLE credit)

**RUSS 3890. Selected Topics.** [Formerly RUSS 294A] May be repeated for a total of 12 credit hours in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3&#59; maximum of 12 credit hours total for all semesters of RUSS 3890 and 3891] (No AXLE credit)

**RUSS 3891. Selected Topics.** [Formerly RUSS 294B] May be repeated for a total of 12 credit hours in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3; maximum of 12 credit hours total for all semesters of RUSS 3890 and 3891] (No AXLE credit)

## Sociology

**SOC 1001. Commons Seminar.** [Formerly SOC 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

**SOC 1010. Introduction to Sociology.** [Formerly SOC 101] The study of human society; the nature of culture and its organization. Processes of communication, socialization, mobility, population growth. Repeat credit for students who have completed 1010W. No credit for students who have earned credit for 103. [3] (SBS)

**SOC 1010W. Introduction to Sociology.** [Formerly SOC 101W] The study of human society; the nature of culture and its organization. Processes of communication, socialization, mobility, population growth. Repeat credit for students who have completed 1010. No credit for students who have earned credit for 103. [3] (SBS)

**SOC 1020. Contemporary Social Issues.** [Formerly SOC 102] Social change, conflict, and inequality in modern societies. Basic sociological concepts and methods as they apply to social issues and policy. Focus varies by section. Repeat credit for students who have completed 1020W. [3] (SBS)

**SOC 1020W. Contemporary Social Issues.** [Formerly SOC 102W] Social change, conflict, and inequality in modern societies. Basic sociological concepts and methods as they apply to social issues and policy. Focus varies by section. Repeat credit for students who have completed 1020. [3] (SBS)

**SOC 1041. Men and Women in American Society.** [Formerly SOC 104] This course focuses on ideas about masculinity and femininity and how these ideas carry with them inequalities in the distribution of power and resources available to men and women. We examine how gender permeates seemingly neutral aspects of everyday life – how we date, sexuality, family life, work relationships, political life, media images. Repeat credit for students who have completed 1041W. [3] (P)

**SOC 1041W. Men and Women in American Society.** [Formerly SOC 104W] This course focuses on ideas about masculinity and femininity and how these ideas carry with them inequalities in the distribution of power and resources available to men and women. We examine how gender permeates seemingly neutral aspects of everyday life – how we date, sexuality, family life, work relationships, political life, media images. Repeat credit for students who have completed 1041. [3] (P)

**SOC 1111. First-Year Writing Seminar.** [Formerly SOC 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**SOC 2100. Statistics for Social Scientists.** [Formerly SOC 127] Descriptive and inferential statistics with social science research applications. Sampling issues; describing data with measures of central tendencies and dispersion; hypothesis testing using categorical and continuous indicators; multivariate techniques for continuous, categorical, and time dependent data. Limited to majors and minors in Sociology, Public Policy Studies, and Communication of Science and Technology, with preference given to Sociology majors and minors. [3] (No AXLE credit)

**SOC 3001. Sociological Perspectives.** [Formerly SOC 201] Major classical and contemporary sociological perspectives such as symbolic interactionism, functionalism, and conflict sociology. Attention to the orientation and style of outstanding representatives of each perspective. Analysis in terms of basic concepts, central questions, substantive themes, methodology, and bearing on contemporary social issues. [3] (P)

**SOC 3002. Introduction to Social Research.** [Formerly SOC 211] Overview and evaluation of research strategies. Interpretation of qualitative and quantitative data. Research methods and design. Evaluate research ethics, research hypotheses, and literature reviews. Prerequisite: 1010, 1010W, 1020, or 1020W. Open only to majors. [3] (SBS)

**SOC 3003. Research Practicum.** [Formerly SOC 212] Application of research skills acquired in 3002. A research report, including statement of hypothesis, discussion of data and methods, and interpretation of results, is required. Prerequisite: 3002 and either 2100, MATH 1011 or 2820, or ECON 1500 or 1510. Open also to students who have earned credit for PSY 2100 or PSY-PC 1400 and are majors in Child Development, Child Studies, Cognitive Studies, Human and Organizational Development, or A&S Psychology. [3] (No AXLE credit)

**SOC 3201. Cultural Consumption and Audiences.** [Formerly SOC 228] How audiences and consumers engage with art and culture – from popular music to film, classical art, fashion, and food. [3] (SBS)

**SOC 3202. Cultural Production and Institutions.** [Formerly SOC 229] The production of culture. The role of artists, firms, and markets in creating cultural objects, ideas, and practices, including: novels, television and news, science, music, visual arts, and food. Prerequisite: 3201. [3] (SBS)

**SOC 3203. Art in Everyday Life.** [Formerly SOC 214] Art and the public sphere. Cultural analysis, critical theory, art production and reception, curation, ethnography. [3] (SBS)

**SOC 3204. Tourism, Culture, and Place.** [Formerly SOC 218] The nature of tourist encounters. Marketing and displaying culture to tourists. Implications for urban economies and landscapes, and for tourists and locals. Biweekly field trips in Nashville. Open only to Sociology majors and minors. [3] (SBS)

**SOC 3205. Seeing Social Life.** [Formerly SOC 219] History, theory, and ethics of visual images in sociological research. Truth status of visual data. How individuals and groups use photographs to make sense of social worlds. Race, ethnicity, gender, social class, and their visual documentation. Methods for collection and analysis of visual data, especially photographs. Prerequisite: SOC 1010, 1010W, 1020, 1020W, 1041, 1041W, or ANTH 1101. [3] (SBS)

**SOC 3206. Creativity and Innovation in Society.** [Formerly SOC 227] The social context for innovation and creativity. Interdisciplinary approaches to the creative process, invention, and entrepreneurship. Social relations and networks surrounding creative work; gate keeping; the diffusions of innovation; changing institutions; and economic forces. [3] (SBS)

**SOC 3207. Popular Culture Dynamics.** [Formerly SOC 248] Examination of theories and research that link culture and society. Consideration of the mass media arts with particular emphasis on popular music. Focus on creators, industry, and audiences. [3] (SBS)

**SOC 3213. Artists, Community, and Democracy.** Communities of diverse artists, minority viewpoints, and cultural pluralism in a democratic society. Contemporary United States with cross-cultural and historical comparisons. [3] (SBS)

**SOC 3221. The Family.** [Formerly SOC 230] Study of the relationship of family structure to social organization. Comparative and historical approaches to the family. Recent changes in the American family. Courtship,

marriage, marital adjustment, parenthood, and family dissolution in relation to contemporary American society. [3] (P)

**SOC 3222. Sociology of Religion.** [Formerly SOC 246] Theories of the nature, function, and structure of religion. Religion in America, including fundamentalism, the Black Church, and cults. How religion changes and is changed by secular society. [3] (SBS)

**SOC 3223. Schools and Society: The Sociology of Education.** [Formerly SOC 254] How schools affect individuals and relate to institutions: the government, the economy, social classes, and families. How social attributes, including race and class, affect academic achievement. Controversies such as desegregation and intelligence testing. [3] (SBS)

**SOC 3224W. Sociology through Baseball.** [Formerly SOC 265W] Baseball as a social institution. Group dynamics, baseball as work and business. Free agency and law, race and ethnic relations, and globalization. [3] (SBS)

**SOC 3231. Contemporary Latin America.** [Formerly SOC 277] Current history and long-term trends; regional trade. Development strategies and social inequalities. Hispanic Americans, immigration, and the U.S. border; the war on drugs. Race, music, and popular culture. [3] (INT)

**SOC 3232. Contemporary Mexican Society.** [Formerly SOC 279] Sociological understanding of contemporary Mexican society. Historical roots of the modern Mexican state. Economic, political, and social institutions operating in Mexico, formal and informal structures, and their consequences. [3] (INT)

**SOC 3233. Contemporary American Society.** [Formerly SOC 235] Shifts in the political, economic, and social structure of the United States; changes in technology, demography, and social mores. [3] (US)

**SOC 3301. Society and Medicine.** [Formerly SOC 237] Cultural and social factors in the perception, definition, diagnosis, treatment, and distribution of disease. Doctor-patient relations; role of nurses and other health professions. Social consequences of hospitals, medical technology, medical specialization, and health insurance. [3] (SBS)

**SOC 3302. Poverty, Health, and Politics.** [Formerly SOC 205] Politics of poverty, health, and social welfare policy in the U.S. from the 1930s to the present. Profiles of poverty and health. Social change, social movements, advocacy, and social enterprise. [3] (SBS)

**SOC 3303. Social Dynamics of Mental Health.** [Formerly SOC 264] Definition and classification of mental health and mental illness. Emphasis on social factors affecting mental health. Different ways of responding to persons in poor mental health and consequences of particular responses. [3] (SBS)

**SOC 3304. Race, Gender, and Health.** [Formerly SOC 268] Effect of racial and ethnic background, gender, socioeconomic status, sexual identity, and age or generation on the experiences of health, illness, medical institutions, and work in the health professions. [3] (SBS)

**SOC 3311. Climate Change and Society.** [Formerly SOC 207] The sociology of climate change, including efforts to reduce greenhouse gases and problems caused by climate change. Comparative analysis of how governments and businesses develop strategies to adapt to climate change. [3] (SBS)

**SOC 3312. Environment and Development.** [Formerly SOC 208] Relationship between economic development and the natural environment. Implications of development on our contemporary ways of life and the environmental conditions of our planet. Different models of development for both Western industrial and developing societies, from early imperialism to contemporary globalization. Current global environmental crises, problems of environmental inequality and injustice, and social movements for alternative development initiatives. [3] (SBS)

**SOC 3313. Sociology of Health and Environmental Science.** [Formerly SOC 206] Basic concepts in the sociology of science and their applications to controversies in the health and environmental sciences. Toxins and risk, nutrition, and health. Health and environmental aspects of emerging technologies. Case studies to develop generalizable social-science hypotheses. [3] (SBS)

**SOC 3314. Environmental Inequality and Justice.** [Formerly SOC 221] Relationships between social inequalities and environmental degradation, both in the U.S. and internationally. Distribution of environmental hazards across race and class, natural resource rights and management, urban health and sustainability, climate injustices, and environmental justice movements. No credit for students who have earned credit for WGS 1111 section 4. [3] (SBS)

**SOC 3315. Human Ecology and Society.** [Formerly SOC 270] Demography, social organization, technology, and the global environment. Shifting energy systems; sustainable industries; food production. Growth vs. development. Affluence, waste, and recycling. [3] (INT)

**SOC 3316. Business, Civil Society, and the Environment.** Environmental sustainability and social responsibility; interactions among private sector, civil society, state, and consumers. Social movements and industry, politics of green consumption, and rise of third-party certification movements and private governance. Agriculture, fishing, and forestry industries. [3] (SBS)

**SOC 3317. Energy Transitions and Society.** Comparisons of contemporary societies' transition to low-carbon energy systems. Emphasis on renewable energy and energy efficiency. Perspectives include both wealthy and poor countries. [3] (INT)

**SOC 3318. Sociology of Green Jobs.** Comparative, historical, and theoretical perspectives of the contemporary transformation of work and employment in green jobs. Emphasis on the U.S. economy. [3] (SBS)

**SOC 3321. Population and Society.** [Formerly SOC 220] The mutual influence of demographic factors and social structure. Trends in fertility, mortality, population growth, distribution, migration, and composition. Population policy and national development. [3] (INT)

**SOC 3322. Immigration in America.** [Formerly SOC 274] Theories of international migration, with an emphasis on migration as a social process. Economic and social impact, including assimilation, immigrant incorporation, and the second generation. The migrant experience, including transnational practices, and how immigration redefines race, ethnicity, and gender. Immigration history of the United States. Current U.S. immigration law and policy. Debate on open borders. [3] (SBS)

**SOC 3601. Self, Society, and Social Change.** [Formerly SOC 204] Problems and prospects for individual participation in social change; volunteering, community service, and philanthropy; role of individuals and voluntary associations in social change. [3] (SBS)

**SOC 3602. Change and Social Movements in the Sixties.** [Formerly SOC 216] Mid-1950s to mid-1970s. The rise and influence of social movements in the 1960s, including civil-rights, student, anti-Vietnam War, feminist, and countercultural. [3] (SBS)

**SOC 3603. Women and Social Activism.** [Formerly SOC 225] History of women's participation in social movements. Women's citizenship, environmentalism, second- and third-wave feminism, hate movements, and global feminist activism. Theories of mobilization, collective identity, strategy, and movement outcomes. No credit for students who earned credit for 1111 section 17. [3] (SBS)

**SOC 3604. American Social Movements.** [Formerly SOC 249] The effect of key social movements on American society. Comparison of the organization and success of movements such as the American Revolution, Southern Secession, Populism, Woman's Suffrage, and Civil Rights. [3] (US)

**SOC 3605. Law and Social Movements.** [Formerly SOC 252] Social activists and their relationship to the law and legal institutions. Activist litigation, movement legislative influence, protest policing, government surveillance of activists, and rights consciousness. Civil rights, women's, LGBT, environmental, and labor movements. [3] (SBS)

**SOC 3611. Women and the Law.** [Formerly SOC 224] History of laws subordinating women and efforts by feminists to achieve substantive and procedural equity. American historical examples augmented by comparative research. Examines employment law, laws making rape and domestic violence illegal, and tax law. [3] (P)

**SOC 3612. Class, Status, and Power.** [Formerly SOC 236] Analysis of the competition for jobs, advancement, and income. The influence of social background, education, politics, race, sex, changes in national economy, and other factors will be considered. Theoretical and empirical analysis focusing on the United States. [3] (SBS)

**SOC 3613. Law and Society.** [Formerly SOC 240] Examines the relationship between the legal system and other institutions with illustrations drawn from both American and other societies. The actual operation of the legal system including lawyers, courts, and police is described. [3] (SBS)

**SOC 3614. Politics, State, and Society.** [Formerly SOC 244] The relationship between state and society; the nature and distribution of power in democratic society; the social conditions necessary for democracy; social movements and protest in political change; and the politics of public policy making. Attention to political actions, definitions of citizenship, and political ideology. [3] (SBS)

**SOC 3615. Human Behavior in Organizations.** [Formerly SOC 247] Organizations are treated as resources in the production and distribution of goods and services. Case analyses from the economy are reviewed to diagnose "organizational pathologies" and to understand reciprocal impacts among organizational structures, leaders, and citizens. [3] (SBS)

**SOC 3616. Women and Public Policy in America.** [Formerly SOC 251] A study of public policies as they affect women in contemporary American society. Issues considered include participation of women in the labor force; effects of employment patterns on the family; birth control, abortion, and health care policies; child care; participation of women in political processes; divorce, child support, and custody; affirmative action policies; present governmental remedies and proposed alternatives. [3] (SBS)

**SOC 3621. Criminology.** [Formerly SOC 231] The nature, distribution, causes, and control of crime with emphases on contemporary American society and a broad range of types of crime. [3] (SBS)

**SOC 3622. Delinquency and Juvenile Justice.** [Formerly SOC 232] The nature, distribution, causes and control of juvenile delinquency and the operation of the juvenile justice system in contemporary American society. [3] (SBS)

**SOC 3623. Deviant Behavior and Social Control.** [Formerly SOC 233] The social causes of, and societal reactions to, several types of deviant behavior (e.g., juvenile delinquency, crime, sex deviance, mental illness). Examines the probable consequences of suggested solutions to reduce different types of deviant behavior. [3] (SBS)

**SOC 3624. Prison Life.** [Formerly SOC 234] Prison life from the perspective of prisoners, officials, and the society in which they operate. [3] (SBS)

**SOC 3701. Racial Domination, Racial Progress.** [Formerly SOC 253] Racial and ethnic relations in contemporary American society. Impact of race and ethnicity on education, economics, politics, family, and health. Study of Whites, Blacks, Hispanics, Asians, and Native Americans. Color-blind ideology. [3] (SBS)

**SOC 3702. Racial and Ethnic Minorities in the United States.** [Formerly SOC 255] Status of blacks, Asians, Hispanics, and other minorities. Migration, identity and association, and strategies to improve group status and reduce intergroup tensions. Comparisons to other countries. [3] (SBS)

**SOC 3703. Social Psychology of Prejudice.** [Formerly SOC 262] Prejudice and its amelioration. Problems of relations between blacks and whites in the United States. [3] (SBS)

**SOC 3704. Race, Gender, and Sport.** [Formerly SOC 256] Manifestations of race and gender in sport. Emphasis on race and gender ideologies and the associated inequalities in sport in America. International comparisons for context. [3] (SBS)

**SOC 3711. Women, Gender, and Globalization.** [Formerly SOC 239] Globalization and its impact on women and gender relations. Multinational corporations, economic development, and inequality; new forms of work; human rights; feminist movements for change. [3] (INT)

**SOC 3722. Gender in Society.** [Formerly SOC 250] Theoretical approaches to gender relations with a focus on the contemporary U.S. Evolution of gender stereotypes, gender socialization over the life course,

gender in social interactions, institutional sources of gender inequality, and intersections of gender with race, social class, and sexual identity. Topics include work, school, families, health, and intimate relationships. [3] (SBS)

**SOC 3723. Gender, Sexuality, and the Body.** [Formerly SOC 257] The body is a physical marker of gender and sexuality. Biological reproduction is saturated with social meanings - shaping ideas about masculinity, femininity, the gender division of labor, and heterosexuality. In this course, we will look at the body as reflexive project and as the site of historical and ideological significance. We address race, ethnicity, physical abilities, and class in explaining variations in cultural ideals. [3] (SBS)

**SOC 3724. Gender Identities, Interactions, and Relationships.** [Formerly SOC 272] Gender identities form and influence interactions in friendships, intimate relations, families, education, and other institutions. Changes and continuities in gender roles within the United States and ways in which race, class, and sexual orientation intersect processes of gender relations. [3] (SBS)

**SOC 3851. Independent Research and Writing.** [Formerly SOC 299] May be repeated for a total of 6 credits. Students may enroll in more than one section of this course each semester. [1-6; maximum of 6 credits total for all semesters of 3851] (No AXLE credit)

**SOC 3880. Internship Training.** [Formerly SOC 280B] Under faculty supervision, students gain experience in any of a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations. Background reading and research will be completed in Sociology 3881 concurrently with the completion of internship training, Sociology 3880. A minimum of 3 hours of 3881 must be completed with hours taken in 3880. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, completion of 6 hours of prior work in sociology, and prior departmental approval of the student's plans are required. Offered on a pass/fail basis only and must be taken concurrently with 3881. Hours of 3880 may not be included in the minimum hours counted toward the sociology major. Corequisite: 3881. [1-9] (No AXLE Credit)

**SOC 3881. Internship Readings and Research.** [Formerly SOC 280A] Under faculty supervision, students gain experience in any of a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations. Background reading and research will be completed in Sociology 3881 concurrently with the completion of internship training, Sociology 3880. A minimum of 3 hours of 3881 must be completed with hours taken in 3880. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, completion of 6 hours of prior work in sociology, and prior departmental approval of the student's plans are required. Corequisite: 3880. [3-6] (No AXLE credit)

**SOC 4961. Seminars in Selected Topics.** [Formerly SOC 294] May be repeated for a total of 6 credits if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 6 credits total for all semesters of 4961] (No AXLE credit)

**SOC 4981. Honors Research.** [Formerly SOC 296] Research and writing supervised by department staff culminating in the Senior Honors Thesis. Work consists of both background reading and active research. May be repeated for a total of 12 credits if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. Open only to honors candidates. Prerequisite or corequisite: 3002. [3-6; maximum of 12 credits total for all semesters of 4981] (No AXLE credit)

## Spanish

**SPAN 1001. Commons Seminar.** [Formerly SPAN 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**SPAN 1100. Elementary Spanish I for True Beginners.** [Formerly SPAN 100] Designed exclusively for students with no previous exposure to Spanish. Development of basic listening, speaking, reading, and writing skills with Spanish-speaking culture through a communicative approach. Conducted primarily in Spanish. Not open to students with previous training in Spanish. Four hours of classroom instruction plus one hour of independent

research activities. Students continuing in Spanish take 1102. No credit for students who have already completed 1100 or have earned credit for a more advanced Spanish language course. Students wishing to repeat this course must take 1101 for repeat credit. [5] (No AXLE credit)

**SPAN 1101. Elementary Spanish I.** [Formerly SPAN 101] Basic listening, speaking, reading, and writing skills. Communicative approach and exposure to aspects of Spanish-speaking cultures. Conducted entirely in Spanish. Four hours of classroom instruction plus one hour of independent research activities. Intended for students with prior study of the language and a departmental placement score under 275. Serves as repeat credit for students who have completed 1100. No credit for students who have earned credit for a more advanced Spanish language course. [5] (No AXLE credit)

**SPAN 1102. Elementary Spanish II.** [Formerly SPAN 102] Further development of listening, speaking, reading, and writing skills using a communicative approach. Exposure to aspects of Spanish-speaking culture. Conducted entirely in Spanish. Four hours of classroom instruction plus one hour of independent research activities. Students continuing in Spanish take 2203. No credit for students who have earned credit for a more advanced Spanish language course. Prerequisite: 1100 or 1101. [5] (INT)

**SPAN 1103. Intensive Elementary Spanish.** [Formerly SPAN 103] A communicative approach to reading, writing, listening, and speaking for students who have studied one to three years of Spanish. Rigorous review of elementary Spanish through four hours of class instruction and one hour of independent research activities. Departmental Spanish placement exam score of 275-364. Students continuing in Spanish take 2203. No credit for students who have earned credit for 1100, 1101, or 1102. No credit for students who have earned credit for a more advanced Spanish language course. [5] (INT)

**SPAN 1111. First-Year Writing Seminar.** [Formerly SPAN 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**SPAN 2203. Intermediate Spanish.** [Formerly SPAN 104] Development of intermediate linguistic competence in Spanish (listening, speaking, reading, and writing) using a communicative approach. Study of cultures of Spanish-speaking countries by incorporating authentic materials. Four hours of classroom instruction plus one hour of independent research activities. Intended for students who have earned credit for 1102 or 1103 or have a departmental placement score of 365-440. No credit for students who have earned credit for a more advanced Spanish language course. [5] (INT)

**SPAN 2780. Intensive Spanish.** [Formerly SPAN 200] A one-month intensive course in the Spanish language, meeting before regular classes begin. Emphasis is placed on conversation, reading, composition, and grammar. Offered only in the Vanderbilt in Spain program. [3] (INT)

**SPAN 2990. Images of the Feminine in Spanish Cinema.** [Formerly SPAN 292] Spanish national cinema from the death of Francisco Franco to the present. Stories written, directed, and told by men about women. Taught in English with subtitled films. Serves as repeat credit for students who completed 296 section 1 in summer 2007, summer 2008, and summer 2009. [3] (P)

**SPAN 2995. Contemporary Latin American Prose Fiction in English Translation.** [Formerly SPAN 293] Themes and techniques of the contemporary novel, novella, and short story written by both men and women in Spanish America and Brazil. No credit for graduate students in Spanish or Portuguese. [3] (HCA)

**SPAN 3301W. Intermediate Spanish Writing.** [Formerly SPAN 201W] Development of abilities in composition tasks related to expository writing. Focus on rhetorical techniques for organizing information, vocabulary abilities, and emphasis on collaborative work. Students write several short papers and a final long paper. Intended for students who have earned credit for 2203 or have a departmental Spanish placement exam score of 441 or higher. [3] (INT)

**SPAN 3302. Spanish for Oral Communication through Cultural Topics.** [Formerly SPAN 202] Development of speaking skills through the study of Spanish and Hispanic culture, and Spanish and Spanish-American current affairs. Texts drawn from contemporary articles, short stories, TV news, documentaries, and Web materials. Different registers of spoken Spanish. The development of effective strategies for oral communication. Offered on a graded basis only. Prerequisite: 3301W. Students with advanced oral skills will be placed in a higher level course. [3] (INT)

**SPAN 3303. Introduction to Spanish and Spanish American Literature.** [Formerly SPAN 203] Critical reading and methods of literary analysis. Selections cover all genres in several periods. Prerequisite: 3301W and 3302. [3] (HCA)

**SPAN 3320. Introduction to Hispanic Cultural Studies.** [Formerly SPAN 204] An examination of contemporary Hispanic culture through a variety of media (newspapers, magazines, comics, Web sites), arts, and entertainment. Prerequisite: 3301W and 3302. Not open to students who have studied abroad. [3] (INT)

**SPAN 3325. The Way of Saint James.** [Formerly SPAN 205] Origins and development of the Way of Saint James, or Camino de Santiago, through an examination of literature, art, history, and cultural and religious issues. Contributions from the cult of Saint James and the Way to Spanish national identity. Repeat credit for students who completed 296 section 1 in summer 2012 and summer 2013. Prerequisite: 3301W and 3302. [3] (HCA)

**SPAN 3330. Cultural Studies in the Andes.** [Formerly SPAN 224] Contemporary Andean culture through the lenses of anthropology and archaeology. Popular and elite artistic productions, cultural syncretism, and festive culture. Gender and society. Emphasis on hands-on learning on site. Locations include Lima, Cuzco, and Machu Picchu. Maymester only. Repeat credit for students who completed 204 section 1 in summer 2013 and summer 2014. Prerequisite: 3301W and 3302. [3] (INT)

**SPAN 3340. Advanced Conversation.** [Formerly SPAN 207] An intercultural approach contrasting Hispanic and American perspectives. Discussions and oral presentations on contemporary issues. For students with a high level of oral proficiency, especially those returning from a semester abroad. Offered on a graded basis only. Prerequisite: 3302. [3] (INT)

**SPAN 3345. Spanish for Business and Economics.** [Formerly SPAN 206] Linguistic skills and cultural information for conducting business in the Spanish-speaking world. Basic syntactic and phonological structures within the context of business. Activities to develop written, oral, and aural skills in several areas, including finance, management, marketing, and tourism. Offered on a graded basis only. Prerequisite: 3301W and 3302. [3] (INT)

**SPAN 3350. Spanish for the Legal Profession.** [Formerly SPAN 210] Advanced conversation course emphasizing specialized Spanish legal terminology. The development of linguistic proficiency and cultural competency. Vocabulary acquisition, grammar review, translation practice, oral presentations, and written papers. Prerequisite: 3301W, 3302, and 3303. [3] (INT)

**SPAN 3355. Advanced Conversation through Cultural Issues in Film.** [Formerly SPAN 208] Spanish and Latin American films as the basis for discussion and analysis of linguistic, historic, cultural, and social issues. Students are expected to have completed at least one Spanish language course beyond 3303. Prerequisite: 3301W, 3302, and 3303. [3] (INT)

**SPAN 3360. Spanish Civilization.** [Formerly SPAN 221] The development of Spanish culture from the Middle Ages to the present in the context of Western civilization. Discussion of historical background, literary and artistic trends, and political and socioeconomic patterns. Not open to students who have attended Vanderbilt in Spain. Prerequisite: 3301W and 3302. [3] (INT)

**SPAN 3365. Film and Recent Cultural Trends in Spain.** [Formerly SPAN 226] The cinema and Spanish cultural evolution during and after the Franco dictatorship. Prerequisite: 3303. [3] (INT)

**SPAN 3370. Spanish American Civilization.** [Formerly SPAN 223] The development of Spanish American culture from colonial times to the present; discussion of basic institutions, political and socioeconomic patterns, education, the arts, and folklore. Prerequisite: 3301W and 3302. [3] (INT)

**SPAN 3375. Film and Culture in Latin America.** [Formerly SPAN 227] Latin American cinema in historical perspective. Screenings, critical readings, and supplementary texts. Prerequisite: 3303. [3] (P)

**SPAN 3380. The Spanish Language.** [Formerly SPAN 209] An advanced grammar course with emphasis on problem constructions, stylistics, and composition. Offered only in the Vanderbilt in Spain program. [3] (INT)

**SPAN 3385. Creative Writing and Advanced Grammar.** Development of writing skills through advanced grammatical concepts, vocabulary, and writing techniques and the production of short stories, essays, poems, and other forms of textual discourse. Prerequisite: 3303. [3] (INT)

**SPAN 3830. Spanish for the Medical Profession.** [Formerly SPAN 211] Advanced conversation course incorporating linguistic skills and cultural information relevant to medical issues in the Hispanic world. Service learning with the Latino and Latina community as an important component. Prerequisite: 3301W and 3302. [3] (INT)

**SPAN 3835. Latino Immigration Experience.** [Formerly SPAN 243] Literature and film that depict the immigration and assimilation experiences of the main Latino groups. Service to the Latino community integral part of course work. Prerequisite: 3303. [3] (P)

**SPAN 3850. Independent Study.** [Formerly SPAN 289] Designed primarily for majors. Projects are arranged with individual professors and must be approved by the director of undergraduate studies before the close of registration in the semester of the project. May be repeated for a total of 12 credits over a four semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of SPAN 3850] (No AXLE credit)

**SPAN 3880. Internship Training in Spain.** [Formerly SPAN 287B] Under faculty supervision, students gain experience in public or private organizations and complete research and readings. Offered on a pass/fail basis only and must be taken concurrently with 3881. Corequisite: 3881. [1] (No AXLE credit)

**SPAN 3881. Internship Readings and Research in Spain.** [Formerly SPAN 287A] Under faculty supervision, students gain experience in public or private organizations, and complete research and readings. Must be taken concurrently with 3880. Corequisite: 3880. [3] (No AXLE credit)

**SPAN 3891. Special Topics in Hispanic Culture.** [Formerly SPAN 296] Prerequisite: 3303. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**SPAN 3892. Special Topics in Spanish Language and Linguistics.** [Formerly SPAN 295] Prerequisite: 3303. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**SPAN 3893. Special Topics in Hispanic Literature.** [Formerly SPAN 294] Prerequisite: 3303. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**SPAN 4300. Introduction to Spanish Linguistics.** [Formerly SPAN 212] Major linguistic subsystems of the Spanish language. Morphology, syntax, phonetics and phonology. Semantics and pragmatics, dialectology, and sociolinguistics. No previous knowledge of linguistics required. No credit for students who earned credit for 295 section 1 in spring 2011. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4310. Translation and Interpretation.** [Formerly SPAN 213] Theory and practice of translation and interpretation, both from English to Spanish and Spanish to English. Practical knowledge of the basic modes of translation (direct and oblique) and interpretation (sight, consecutive, and simultaneous). Emphasis on the fundamentals of translation in legal, medical, literary, business, commercial, media, sports, and other fields. Prerequisite: 3303. [3] (SBS)

**SPAN 4315. Contrastive Analysis of Spanish and English.** [Formerly SPAN 217] A comparison of the phonological, morphological, and syntactical structures of Spanish and English to demonstrate the similarities and differences between the linguistic systems of these two languages. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4320. Phonology.** [Formerly SPAN 216] Analysis of the production, nature, and systematic function of the sounds of the Spanish language, as well as of problems frequently experienced by non-native speakers. Both standard and dialect features of Spanish are examined. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4325. Dialectology.** [Formerly SPAN 214] Formation, general characteristics, distinctive features, and geographical extension of the principal dialectal regions of Spain and Spanish America. Both historical and modern dialects are considered. Emphasis on non-standard dialectal varieties of Spanish. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4330. Words and Stems.** [Formerly SPAN 215] A morphological presentation of the structural principles governing the creation of noun, verb, adjective, and adverb along with an overview of the formation of the underlying stems. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4335. Morphology and Syntax.** [Formerly SPAN 218] An introduction to the principles of modern Spanish morphology (word formation) and syntax (phrase structure and usage) through an analysis of the native speaker's organization of reality and use of language to reflect and to express that organization. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4340. History of the Spanish Language.** [Formerly SPAN 219] Origins and evolution of the Spanish (Castilian) language. Emphasis on the phonological and morphological development of Spanish within historical and cultural contexts of the Iberian Peninsula. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4345. The Languages of Spain.** [Formerly SPAN 220] Origins, development, and the contemporary sociolinguistic situation of the principal languages and dialects of Spain, including Castilian, Catalan, Galician, and Basque. Prerequisite: 3301W and 3302. [3] (SBS)

**SPAN 4350. Communicating Across Cultures.** [Formerly SPAN 282] Relationships among discourse, identity, and culture. Linguistic construction of ethnicity and gender. Latin American and U.S. Latino ways of speaking. Serves as repeat credit for student who completed 295 section 1 in spring 2005 or spring 2008. [3] (SBS)

**SPAN 4355. Spanish in Society.** [Formerly SPAN 283] Language variation and linguistic change. Regional, socioeconomic, gendered, and ethnic differences in spoken Spanish. Language as it shapes the identities of speakers. Language use in social contexts with comparisons to English. Prerequisite: 3303. [3] (SBS)

**SPAN 4360. Discourse Analysis.** [Formerly SPAN 285] Linguistic pragmatics. Speech acts in conversation as patterned activity rather than unpredictable behavior. Implications, presuppositions, discourse markers, and other pragmatic units. Comparisons with English. Prerequisite: 3303. [3] (SBS)

**SPAN 4400. The Origins of Spanish Literature.** [Formerly SPAN 231] From its beginnings to the Renaissance; the creation of a social order and a cultural tradition. Close study of three literary landmarks – *Poema del Cid*, *Libro de Buen Amor*, *La Celestina* – and other prose and poetry selections. Prerequisite: 3303. [3] (HCA)

**SPAN 4405. Literature of the Spanish Golden Age.** [Formerly SPAN 232] Representative works from early modern Spain, including poetry, prose, and drama of the Renaissance and Baroque periods. Prerequisite: 3303. [3] (HCA)

**SPAN 4410. Spanish Literature from the Enlightenment to 1900.** [Formerly SPAN 233] Essays and Neoclassic literature. Romanticism, Realism, and Naturalism. Representative works and authors from all genres. Prerequisite: 3303. [3] (HCA)

**SPAN 4415. Spanish Literature from 1900 to the Present.** [Formerly SPAN 234] Representative authors and works. Prerequisite: 3303. [3] (HCA)

**SPAN 4420. Spanish American Literature from the Conquest to 1900.** [Formerly SPAN 235] Development of all forms from colonial times to the end of the 19th century. Patterns of interaction of Amerindian, African, and European cultural traditions. Unity and diversity of Spanish American literature. Prerequisite: 3303. [3] (HCA)

**SPAN 4425. Spanish American Literature from 1900 to the Present.** [Formerly SPAN 236] The works of Neruda, Borges, Paz, García Márquez and others. Prerequisite: 3303. [3] (HCA)

**SPAN 4440. Development of the Short Story.** [Formerly SPAN 260] From early manifestations in Spain through its current forms in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

**SPAN 4445. Development of the Novel.** [Formerly SPAN 239] From the seventeenth century through Realism and Naturalism in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

**SPAN 4450. The Contemporary Novel.** [Formerly SPAN 240] New forms in the twentieth-century novel in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

**SPAN 4455. Development of Drama.** [Formerly SPAN 251] Spanish theatrical works from 1600 to 1900, including the Golden age comedia, neoclassicism, romanticism, and early realism in drama. Prerequisite: 3303. [3] (HCA)

**SPAN 4465. The Theory and Practice of Drama.** [Formerly SPAN 281] Critical works and plays from different periods. Introduction to the principles of dramaturgy. Prerequisite: 3303. [3] (HCA)

**SPAN 4470. Development of Lyric Poetry.** [Formerly SPAN 230] Popular and traditional forms; the sonnet and other Renaissance and Baroque classical forms. Romanticism. Prerequisite: 3303. [3] (HCA)

**SPAN 4475. Contemporary Lyric Poetry.** [Formerly SPAN 237] From Modernism to the present in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

**SPAN 4550. The Theory and Practice of Literary Translation.** [Formerly SPAN 271] Theoretical approaches and their consequences for the interpretation of translated texts. Practical application of these principles in the translation of both Spanish and Portuguese texts into English. Taught in Spanish. Written work in Spanish or Portuguese. Serves as repeat credit for students who completed 294 section 3 in fall 2013 or spring 2013, or 294 section 1 in spring 2012. Prerequisite: 3303. [3] (HCA)

**SPAN 4620. Love and Honor in Medieval and Golden Age Literature.** [Formerly SPAN 256] The evolution of the key themes of love and honor in works from various genres of medieval and Golden Age Spanish literature with special attention to sociohistorical context. Prerequisite: 3303. [3] (HCA)

**SPAN 4640. Don Quixote.** [Formerly SPAN 246] Directed reading and intensive study of the novel. Prerequisite: 3303. [3] (HCA)

**SPAN 4670. Spanish Realism.** [Formerly SPAN 258] Methods of, implications to, and pitfalls of creating realistic characters in nineteenth-century Spanish novels. Prerequisite 3303. [3] (HCA)

**SPAN 4690. Alterity and Migration in Spain.** [Formerly SPAN 265] Historical and literary texts about nationalism and cultural difference. Representations of contact with Africa, the Americas, and Asia; regional identities; immigration; gender and racial issues. Repeat credit for students who completed 294 section 2 in fall 2010 or section 1 in spring 2014. Prerequisite: 3303. [3] (P)

**SPAN 4720. Literary Genres and National Identities in Latin America.** [Formerly SPAN 277] A comparative approach to the rise of the national literary traditions from independence to the latter half of the twentieth century. Indigenist novels, abolitionist narratives, and gaucho poetry by colonial figures, including African slaves, indigenous peoples, and Argentine Gauchos. Serves as repeat credit for students who completed 294 section 1 in spring 2013. Prerequisite: 3303. [3] (P)

**SPAN 4730. Modern Latin American Poetry.** [Formerly SPAN 273] Development of poetry in Spanish America and Brazil during the twentieth century. Major poets and movements, including both Spanish American

Modernismo and Brazilian Modernismo. Poetry as a genre; composition and discussion of students' poetry. Taught in Spanish. Serves as repeat credit for students who completed 294 section 2 in fall 2013 or 294 section 1 in fall 2012. Prerequisite: 3303. [3] (HCA)

**SPAN 4740. Spanish-American Literature of the Boom Era.** [Formerly SPAN 247] The Boom novel of the 1960s: Carlos Fuentes' *La muerte de Artemio Cruz*, Julio Cortázar's *Rayuela*, Mario Vargas Llosa's *La ciudad y los perros*, Guillermo Cabrera Infante's *Tres tristes tigres*, and Gabriel García Márquez's *Cien años de soledad*. Prerequisite: 3303. [3] (HCA)

**SPAN 4741. Spanish-American Literature of the Post-Boom Era.** [Formerly SPAN 248] The post-Boom novel from the 1970s to the present; analysis of related films. Manuel Muig's *Boquitas pintadas*, *Me llamo Rigoberta Menchú*, Laura Esquivel's *Coma agua para chocolate*, Reinaldo Arená's *Viaje a La Habana*, and Daisey Rubiera Castillo's *Reyita, sencillamente*. Prerequisite: 3303. [3] (P)

**SPAN 4750. Afro-Hispanic Literature.** [Formerly SPAN 244] From nineteenth-century slave narrative to modern writers such as Miguel Barnet, Alejo Carpentier, and Quince Duncan. Prerequisite: 3303. [3] (P)

**SPAN 4755. Latina and Latin American Women Writers.** [Formerly SPAN 275] Contemporary writing of women in Latin America and of Latinas in the United States. Representation of sexuality and the maternal body. Prerequisite: 3303. [3] (P)

**SPAN 4760. Literature and Medicine.** [Formerly SPAN 274] Modern intersections of literature and medicine in Latin America. From the social hygiene literature of the nineteenth century to the autobiographical disease narrative of the late twentieth century. Prerequisite 3303. [3] (P)

**SPAN 4810. Images of the City.** [Formerly SPAN 263] Literary representations of cityscapes in Spain and Latin America. Repeat credit for students who completed 294 section 2 in fall 2011. Prerequisite: 3303. [3] (HCA)

**SPAN 4980. Undergraduate Seminar.** [Formerly SPAN 280] Close contextual readings of major Hispanic literary texts through selected critical approaches. Open to junior and senior majors in Spanish; required of candidates for honors. Prerequisite: 3303. [3] (HCA)

**SPAN 4998. Senior Honors Thesis.** [Formerly SPAN 299A] [3] (No AXLE credit)

**SPAN 4999. Senior Honors Thesis.** [Formerly SPAN 299B] [3] (No AXLE credit)

## Theatre

**THTR 1001. Commons Seminar.** [Formerly THTR 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**THTR 1010. Fundamentals of Theatre.** [Formerly THTR 100] An introduction to the various elements that combine to form a theatrical experience; the development of critical standards to judge these elements in performance. No credit for students who have earned credit for 1111. Repeat credit for students who have completed 1010W. [3] (HCA)

**THTR 1010W. Fundamentals of Theatre.** [Formerly THTR 100W] An introduction to the various elements that combine to form a theatrical experience; the development of critical standards to judge these elements in performance. No credit for students who have earned credit for 1111. Repeat credit for students who have completed 1010. [3] (HCA)

**THTR 1111. First-Year Writing Seminar.** [Formerly THTR 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**THTR 1611. Acting I.** [Formerly THTR 219] The role of the actor in the theatre with emphasis on artistic self-expression through improvisation and development of performance skills. Available on a graded basis only. [3] (HCA)



**THTR 1711. Introduction to Theatrical Production.** [Formerly THTR 110] Contemporary concepts, methods, and practices employed in the planning and implementation of stage scenery and lighting. Communication, creative problem solving, and organizational management through research, lecture, and class discussion. [4] (HCA)

**THTR 1741. Art of Scene Painting.** [Formerly THTR 112] Concepts, methods, and practices in scenic artistry. Contemporary and historical examples. Impact on theatrical design and production. [3] (HCA)

**THTR 1751. Fundamentals of Theatre Design.** [Formerly THTR 111] Roles and skills of scenic, costume, and lighting designers. Critical assessment of design quality. Elements and principles of design, script analysis, dramaturgical and visual research, color theory and practice. [4] (HCA)

**THTR 1811. Marshals, Mobsters, Monsters, Magnums, and Musicals: American Movie Genres.** [Formerly THTR 171] Western, gangster, horror, private eye, and musical genres. Representative films from each category reflecting the evolution of the genre and the changing American landscape. [3] (US)

**THTR 2201. Histories of Theatre and Drama I: Ritual and World Performance.** [Formerly THTR 201] Including festivals of ancient Greece, Rome, Medieval Europe, and Mesoamerica; Japanese Noh, Kabuki, and Bunraku; African dance and postcolonial theatre. [3] (INT)

**THTR 2202W. Histories of Theatre and Drama II: The European Stage.** [Formerly THTR 202W] Including the Italian Renaissance, French neoclassicism, English Restoration, German and French romanticism, and the modernist movements of realism, symbolism, Dada and futurism, expressionism, epic theatre, and absurdism. [3] (INT)

**THTR 2204. Histories of Theatre and Drama III: The U.S. Stage.** [Formerly THTR 204] Including British colonial and revolutionary drama; frontier theatre; melodrama; minstrelsy, vaudeville, burlesque, and the musical stage; pageantry and community theatre; postwar realism; African-American, Chicana/o, feminist, and Asian-American theatre movements. [3] (US)

**THTR 2651. Play Direction.** [Formerly THTR 230] Play direction as an aid to critical understanding and appreciation of the theatre. Development of techniques. Prerequisite: 1611. [3] (HCA)

**THTR 2781. The History of Fashion: Sex and Propaganda.** [Formerly THTR 216] Men's and women's fashion from ancient times to the present. Women's roles in society as reflected in their clothing. [3] (P)

**THTR 3201W. Contemporary Drama and Performance Criticism.** [Formerly THTR 206W] Dramatic literature and performance theory. Advanced techniques in writing performance criticism. No credit for students who have earned credit for 203. Prerequisite: at least sophomore standing and 1010, 1010W, or 1111. [3] (P)

**THTR 3281. Theatre in London.** [Formerly THTR 280] Intensive overseas summer study program in contemporary British theatre. Ten productions in London covering a broad spectrum of theatrical offerings. Weekly seminars with artists and administrators from the British professional stage. [3] (P)

**THTR 3311. Playwriting.** [Formerly THTR 225] Instruction in writing plays with critical attention to dramatic themes and characterization. Prerequisite: 1010, 1010W, or 1111 and consent of the instructor. [3] (HCA)

**THTR 3600. Rehearsal-Acting.** [Formerly THTR 221] Students performing major roles in university theatre productions may receive 1 credit hour per role at the discretion of the director. Full character analysis and periodic reports of rehearsal progress are required. Prerequisite: 3611. May be repeated for a total of 3 credits, but students may earn only up to 2 credits per semester of enrollment. [1-2; maximum of 3 credits total for all semesters of THTR 3600] (No AXLE credit)

**THTR 3611. Acting II.** [Formerly THTR 220] The actor's role in the theatre with emphasis on acting as character interpretation and ensemble performance through analysis and scene study. Offered on a graded basis only. Prerequisite: 1611. [3] (HCA)

**THTR 3651. Intermediate Play Direction.** [Formerly THTR 231] Development of theoretical and practical approaches to directing dramatic texts. Emphasis on research, interpretation, and communication. Prerequisite: 2651. [3] (HCA)

**THTR 3700. Rehearsal-Production.** [Formerly THTR 211] Students performing major technical assignments in university theatre productions may receive 1 credit hour per assignment at the discretion of the technical director. Detailed plans of expected work and full reports on all crew sessions are to be submitted. May be repeated for a total of 3 credits, but students may earn only up to 2 credits per semester of enrollment. Prerequisite: consent of instructor. [1-2; maximum of 3 credits total for all semesters of THTR 3700] (No AXLE credit)

**THTR 3721. Elements of Basic Design: Scenery and Props.** [Formerly THTR 212] Aesthetics and processes. Development and communication of design ideas through script analysis, research, virtual and physical model-building. Contemporary scenic practices. Prerequisite: 1711. [4] (HCA)

**THTR 3741. Elements of Basic Design: Costuming and Makeup.** [Formerly THTR 214] Aesthetics and processes. Development and communication of design ideas through the drawing and rendering of the costumed figure. Prerequisite: 1711 or 2781. [4] (HCA)

**THTR 3761. Elements of Basic Design: Lighting and Sound.** [Formerly THTR 213] Aesthetics and processes. Development and communication of design ideas through script analysis and research. Lighting and audio theory and practice. Contemporary lighting and audio technology. Prerequisite: 1711. [4] (HCA)

**THTR 3781. Management in the Theatre.** [Formerly THTR 218] Roles of theatre and stage managers. Tools and methods. Organizational theories and skills. Prerequisite: 1711. [3] (HCA)

**THTR 3851. Independent Study.** [Formerly THTR 289] A research project in selected aspects of theatre and drama to be arranged with the instructor. [Variable credit: 1-3] (No AXLE credit)

**THTR 3891. Selected Topics in Theatre.** [Formerly THTR 294] Intensive study of a particular area of theatre. Emphasis on personal investigation and written reports. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**THTR 4201. Shakespeare in the Theatre.** [Formerly THTR 232] Selected plays and scenes. Theoretical and practical exploration of script, theatre, and audience in terms of production, past and present. [3] (HCA)

**THTR 4611. Problems of Acting Style.** [Formerly THTR 223] Advanced scene study, investigating methods used today to perform drama of past eras which used non-realistic styles. Offered on a graded basis only. Prerequisite: 3611. [3] (HCA)

**THTR 4961. Senior Seminar: Performance Ensemble.** [Formerly THTR 261] Advanced development of artistic, communicative, and organizational skills required to create theatre. Culminates in a public performance. Open to senior majors only. Prerequisite: 1010, 1010W, or 1111; 1711; 1751; 1611; and 2651. [3] (HCA)

**THTR 4998. Senior Honors Thesis.** [Formerly THTR 299A] Independent research and completion of an honors thesis, done in consultation with a member of the faculty in Theatre. Open only to those who qualify to begin departmental honors work in Theatre. [3] (No AXLE credit)

**THTR 4999. Senior Honors Thesis.** [Formerly THTR 299B] Independent research and completion of an honors thesis, done in consultation with a member of the faculty in Theatre. Open only to those who qualify to begin departmental honors work in Theatre. [3] (No AXLE credit)

## Tibetan Language

**TBTN 1101. Elementary Tibetan I (UVA).** Grammar and syntax of spoken and written Tibetan. Listening, speaking, reading, and writing from Tibetan short stories, proverbs, and other sources. Tibetan culture. Offered on a graded basis only. [4] (No AXLE credit)

**TBTN 1102. Elementary Tibetan II (UVA).** Grammar and syntax of spoken and written Tibetan; listening, speaking, reading and writing. Examples from Tibetan short stories and proverbs, among other sources. Exposure to Tibetan culture to improve communication skills, using a dynamic, interactive format. Offered on a graded basis only. Prerequisite: 1101. [4] (INT)

**TBTN 2201. Intermediate Tibetan I (UVA).** Grammar and syntax of spoken and written Tibetan. Listening, speaking, reading, and writing through the integrated use of spoken and literary forms. Enhanced knowledge of Tibetan culture. Offered on a graded basis only. [4] (INT)

**TBTN 2202. Intermediate Tibetan II (UVA).** Grammar and syntax of spoken and written Tibetan; listening, speaking, reading and writing through spoken and literary forms. Further study of Tibetan culture to improve communication skills. Offered on a graded basis only. Prerequisite: 2201. [4] (INT)

## Women's and Gender Studies

**WGS 1001. Commons Seminar.** [Formerly WGS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

**WGS 1111. First-Year Writing Seminar.** [Formerly WGS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

**WGS 1150. Sex and Gender in Everyday Life.** [Formerly WGS 150] Sex and gender roles in culture and society. Gender, race, and class. Women and men in literature, art, culture, politics, institutions. Repeat credit for students who have completed 1150W. [3] (P)

**WGS 1150W. Sex and Gender in Everyday Life.** [Formerly WGS 150W] Sex and gender roles in culture and society. Gender, race, and class. Women and men in literature, art, culture, politics, institutions. Repeat credit for students who have completed 1150. [3] (P)

**WGS 1160. Sex and Society.** [Formerly WGS 160] Historical, cultural, and social contexts of sexual diversity, discrimination, and sexual violence. Understanding the centrality of sexuality to identity; challenging harmful modes of sexual expression; developing critical awareness of sex and sexuality. [3] (P)

**WGS 1272. Feminism and Film.** [Formerly WGS 272] Images of gender and race; techniques, sound, lighting, cinematography in relation in gender. Prerequisite: 1150 or 1150W. [3] (US)

**WGS 2225. Women in Popular Culture.** [Formerly WGS 200] Gender differentiation in popular culture and mass-market products. Portrayal of women in movies, print, music, and the Internet. The sources and effects of these portrayals. Women as both consumers and the consumed. Prerequisite: 1150 or 1150W. [3] (HCA)

**WGS 2240. Introduction to Women's Health.** [Formerly WGS 240] How culture influences women's health, body image, self esteem. Issues include fertility control and child bearing, medical innovations to detect disease, alternative therapies, psychological well-being, sexuality, physical and sexual abuse. Impact of politics on health options for women. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 2242. Women Who Kill.** [Formerly WGS 242] Examination of classical and contemporary representations of women who kill. [3] (P)

**WGS 2243. Sociologies of Men and Masculinity.** [Formerly WGS 243] Traditional and emerging perspectives on masculinity and male gender-roles. Emphasis on relationship between social forces and males' everyday experiences across the life-span. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 2244. The Body, Culture, and Feminism.** The body as a cultural, social, and historical construction. Western culture and narratives of "normalcy" and their impact on identity and representation. Body image and eating disorders. Cultural politics of size, weight, and shape. Disability. Cosmetic surgery. Prerequisite: 1150, 1150W, or 1160. [3] (P)

**WGS 2248. Humor and Cultural Critique in Fannie Flagg's Novels.** [Formerly WGS 248] Humor used to address cultural issues in Southern small-town America from 1920-1970. Gender, race, community, and feminism in Fannie Flagg's novels. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 2249. Women and Humor in the Age of Television.** [Formerly WGS 249] The period 1950 to present. Television variety shows, sitcoms, and stand-up comedy as media for promoting women's humor and feminism. Comedy as a means of dealing with difficult personal and social issues. Prerequisite: 1150 or 1150W. [3] (HCA)

**WGS 2252. Sex and Scandals in Literature.** [Formerly WGS 252] From the eighteenth century to the present. Women's and men's disorderly conduct as represented in literary texts. Charlotte Rowson, Kate Chopin, Edith Wharton, Henry James, and Toni Morrison. [3] (HCA)

**WGS 2254. Feminist Fictions.** [Formerly WGS 254] From the nineteenth century to the present. Feminist ideas and ideals as represented in literary texts. Kate Chopin, Edith Wharton, Virginia Woolf, Alice Walker, and Margaret Atwood. [3] (HCA)

**WGS 2259. Reading and Writing Lives.** [Formerly WGS 259] Interdisciplinary exploration of life-stories as narratives. Strategies of self-representation and interpretation, with particular attention to women. Includes fiction, biography, autobiography, history, ethnography, and the writing of life-story narratives. Repeat credit for students who have completed 2259W. Prerequisite: 1150 or 1150W. [3] (HCA)

**WGS 2259W. Reading and Writing Lives.** [Formerly WGS 259W] Interdisciplinary exploration of life-stories as narratives. Strategies of self-representation and interpretation, with particular attention to women. Includes fiction, biography, autobiography, history, ethnography, and the writing of life-story narratives. Repeat credit for students who have completed 2259. Prerequisite: 1150 or 1150W. [3] (HCA)

**WGS 2262. Gender and Ethics.** [Formerly WGS 262] Religious world-views connected to moral traditions. Epistemological and ethical systems and their relationship to gender and patriarchy. Social construction of gender; violence against women; feminism; and difference. No credit for students who earned credit for RLST 223 before fall 2014. [3] (P)

**WGS 2267. Seminar on Gender and Violence.** [Formerly WGS 267] In-depth study of violence against women, with a service-learning component in a community setting. Topics include domestic abuse, rape, sexual harassment, pornography, and global violence. Focus on problems and potential solutions, examining violence on a societal, institutional, and individual level, interrogating the "personal as political," and exposing power structures that shape our communities. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 2268. Gender, Race, Justice, and the Environment.** [Formerly WGS 268] Gender and racial aspects of environmental degradation. Risk, activism, health and illness, policy and politics. Prerequisite: 1150 or 1150W. [3] (SBS)

**WGS 2270. Ecofeminism: Theory, Politics, and Action.** [Formerly WGS 270] Interconnections among the exploitation of nature, the oppression of women, and the abuse of resources that have led to the current global ecological crisis. [3] (SBS)

**WGS 2612. Lesbian, Gay, Bisexual, and Transgender Studies.** [Formerly WGS 212] Introductory study of sexual identity, queer theory, relationships, politics. Prerequisite: 1150 or 1150W. [3] (HCA)

**WGS 2613. Compulsory Couplehood.** From the nineteenth century to the present. Legal and societal implications of marriage. Marginalization of the single person. Different gendered stereotypes of the uncoupled adult, including the bachelor and the spinster. Non-normative forms of kinship and relationships. Primarily United States with global perspectives. Scholarly and pop-cultural texts. [3] (P)

**WGS 3201. Women and Gender in Transnational Context.** [Formerly WGS 201] Gender as a social construction. Feminist critiques of knowledge, family and work, sexuality, health and medicine, and the women's movement. The future of feminism in global context. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 3246W. Women's Rights, Women's Wrongs.** [Formerly WGS 246W] Intellectual and theoretical foundations for contemporary feminist theory and politics in the United States, based upon works by nineteenth- and twentieth-century authors. Prerequisite: 1150 or 1150W. [3] (US)

**WGS 3250. Contemporary Women's Movements.** [Formerly WGS 250] Recent feminist history. The origins and parameters of women's movements from the 1960's to the present. Repeat credit for students who have completed 3250W. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 3250W. Contemporary Women's Movements.** [Formerly WGS 250W] Recent feminist history. The origins and parameters of women's movements from the 1960's to the present. Repeat credit for students who have completed 250. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 3271. Feminist Legal Theory.** [Formerly WGS 271] Theoretical issues about the interaction between law and gender. Application of feminist analysis and perspective to law relating to family, work, criminal law, reproductive freedom, pornography, and sexual harassment. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 3273. Seminar on Psychoanalysis and Feminism.** [Formerly WGS 273] Historical and contemporary perspectives on the long and ambivalent relationship between psychoanalysis and feminism. Trauma, hysteria, narcissism, gender, and the family. Prerequisite: 1150 or 1150W. [3] (P)

**WGS 3281. Globalization and Policy-Making.** [Formerly WGS 281] Western historical conceptualizations of the state. Socio-political contexts. Prerequisite: 1150 or 1150W. [3] (INT)

**WGS 3850. Independent Study.** [Formerly WGS 289] A program of reading and research for advanced students in an area of women's and gender studies arranged in consultation with an adviser. Prerequisite: 1150 or 1150W. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of WGS 3850] (No AXLE credit)

**WGS 3880. Internship Training.** [Formerly WGS 288A] Under faculty supervision, students gain experience combining theoretical and practical work in a project related to social change and focused on women, feminism, or gender. Legislative, community, educational, or non-profit settings. Internship plan developed between student and faculty sponsor, with approval of Women's and Gender Studies program director. A thorough report and research paper are submitted at the end of the semester. Must be taken on a Pass/Fail basis only and must be taken concurrently with 3882 and/or 3883. These hours may not be included in the minimum hours required for the women's and gender studies major. Prerequisite: 3201 and one other 2000-level (or higher) Women's and Gender Studies course, and a 2.90 grade point average. Corequisite: 3882 and/or 3883. [1-9] (No AXLE credit)

**WGS 3882. Internship Readings.** [Formerly WGS 288C] Under faculty supervision, students gain experience combining theoretical and practical work in a project related to social change and focused on women, feminism, or gender. Legislative, community, educational, or non-profit settings. Internship plan developed between student and faculty sponsor, with approval of Women's and Gender Studies program director. A thorough report and research paper are submitted at the end of the semester. Prerequisite: 3201 and one other 3000-level Women's and Gender Studies course, and a 2.90 grade point average. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit)

**WGS 3883. Internship Research.** [Formerly WGS 288B] Under faculty supervision, students gain experience combining theoretical and practical work in a project related to social change and focused on women, feminism, or gender. Legislative, community, educational, or non-profit settings. Internship plan developed between student and faculty sponsor, with approval of Women's and Gender Studies program director. A thorough report and research paper are submitted at the end of the semester. Prerequisite: 3201 and one other 2000-level (or higher) Women's and Gender Studies course, and a 2.90 grade point average. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit)

**WGS 3891. Special Topics: Topics in Gender, Culture, and Representation.** [Formerly WGS 294A] Topics vary. Prerequisite: 1150 or 1150W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**WGS 3892. Special Topics: Topics in Gender, Society, and Political Economy.** [Formerly WGS 294B] Topics vary. Prerequisite: 1150 or

1150W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**WGS 3893. Selected Topics.** [Formerly WGS 295] Topics vary. Prerequisite: 1150 or 1150W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

**WGS 4960. Senior Seminar.** [Formerly WGS 291] Advanced reading and research. Prerequisite: 1150 or 1150W. [3] (No AXLE credit)

**WGS 4998. Honors Research.** [Formerly WGS 298] Reading and research under the guidance of a faculty supervisor. Consent of both the faculty supervisor and the director of Women's and Gender Studies program required. Open only to honors candidates. May be repeated for a total of 6 credits if there is no duplication in topic. [3-6; maximum of 6 credits total for all semesters of WGS 4998] (No AXLE credit)

**WGS 4999. Honors Thesis.** [Formerly WGS 299] Open only to seniors in the Women's and Gender Studies Honors Program. May be repeated for a total of 6 credits if there is no duplication in topic. [3-6; maximum of 6 credits total for all semesters of WGS 4999] (No AXLE credit)

# College of Arts and Science Administration and Faculty

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 DAVID W. WRIGHT, Ph.D., Dean of Sciences  
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 YOLLETTE T. JONES, Ph.D., Associate Dean  
 ROGER E. MOORE, Ph.D., Associate Dean  
 DANIEL MORGAN, Ph.D., Associate Dean  
 MARTIN RAPISARDA, Ph.D., Associate Dean  
 JONATHAN PETTY, B.A., Associate Dean for Arts and Science  
 Development  
 PATRICK J. RETTON II, B.S., Chief Business Officer  
 MELISSA WOCHER, B.A., Administrative Director

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 LYNN E. ENTERLINE, Nancy Perot Mulford Chair in English  
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 SOHEE PARK, Gertrude Conaway Vanderbilt Chair in Psychology  
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 ANTONIS ROKAS, Cornelius Vanderbilt Chair in Biological Sciences  
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A. B. Learned Chair in Living State Physics  
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DAVID W. WRIGHT, Stevenson Chair in Chemistry  
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Terms expiring May 2018: William J. Collins, John McLean, Cecelia Tichi

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B.S. (Wheaton 2007); M.S. (City College of New York 2009) [2016]
- DAVID W. WRIGHT, Stevenson Chair of Chemistry; Professor of Chemistry; Dean of Sciences, College of Arts and Science  
B.S., B.A. (Tulane 1988, 1988); Ph.D. (Massachusetts Institute of Technology 1993) [2001]
- EDWARD WRIGHT-RIOS, Associate Professor of History  
B.S. (Illinois, Champaign 1987); M.A. (Vanderbilt 1998); Ph.D. (California, San Diego 2004) [2004]
- YIXIANG WU, Assistant Professor of Mathematics  
B.S. (Central South University of Technology [China] 2010); Ph.D. (Louisiana, Lafayette 2015) [2016]
- JULIAN WUERTH, Associate Professor of Philosophy  
B.A. (Chicago 1993); Ph.D. (Pennsylvania 2000) [2009]
- SCOTT A. WYLIE, Assistant Professor of Neurology; Assistant Professor of Neurological Surgery; Assistant Professor of Psychology; Assistant Professor of Psychiatry  
B.A. (Point Loma Nazarene 1993); M.A. (Northern Colorado 1997); Ph.D. (Indiana, Bloomington 2002) [2011]
- DAOXING XIA Professor of Mathematics  
B.S. (Shandong University of Technology [China] 1950); Doctorate (Zhejiang [China] 1952) [1984]
- YAO XU, Research Associate Professor of Biological Sciences  
Ph.D. (Lanzhou [China] 1988) [1995]
- YAQIONG XU, Associate Professor of Electrical Engineering; Associate Professor of Physics  
B.S. (Wuhan [China] 1997); Ph.D. (Chinese Academy of Sciences, Beijing 2002); Ph.D. (Rice 2006) [2009]
- ANNA CATESBY YANT, Senior Lecturer in Anthropology; Assistant Director of the Center for Pre-major Academic Advising and Support  
M.A., Ph.D. (Vanderbilt 2006, 2011) [2011]
- HYE YOUNG YOU, Assistant Professor of Political Science  
B.A. (Seoul National [Korea] 2006); M.A. (Chicago 2008); Ph.D. (Harvard 2014) [2014]
- DAVID HAROLD ZALD, Professor of Psychology; Professor of Psychiatry; Director of Neuroscience  
B.A. (Michigan 1989); Ph.D. (Minnesota 1997) [2000]
- ANDRES ZAMORA, Associate Professor of Spanish  
B.A. (Universidad Complutense de Madrid [Spain] 1984); M.A. (Auburn, Montgomery 1986); Ph.D. (Southern California 1994) [1998]
- ELIZABETH ZECHMEISTER, Professor of Political Science  
B.A. (Loyola 1994); M.A. (Chicago 1996); Ph.D. (Duke 2003) [2008]
- CHRISTOPH MIRKO ZELLER, Associate Professor of German; Associate Professor of European Studies  
M.A., Ph.D. (Universität Stuttgart [Germany] 1995, 1998) [2004]
- XIAOYA ZHA, Adjoint Professor of Mathematics  
B.S. (Anhui Laodong [China] 1982); M.S. (Huazhong University of Science and Technology [China] 1984); Ph.D. (Ohio State 1993) [1994]
- DECHAO ZHENG, Professor of Mathematics  
B.S. (Chongqing [China] 1982); M.S. (Sichuan University [China] 1985); Ph.D. (Michigan State 1998) [1996]
- DENIS A ZHERNOKLEYEV, Lecturer in Russian  
B.A. (Fresno Pacific 2006); M.Div. (Yale 2010) [2016]
- RUTH GRACE ZIBART, Professor of French, Emerita  
B.S. (Tennessee Technological 1941); M.A. (Vanderbilt 1942); Ph.D. (Michigan 1964) [1964]
- MELVIN ZIEGLER, Paul E. Shwab Chair in Fine Arts; Professor of Art; Chair of the Department of Art  
B.F.A. (Kansas City Art Institute 1978); M.F.A. (California Institute of the Arts 1982) [2007]
- ARIELL ZIMRAN, Assistant Professor of Economics  
B.S.F.S. (Georgetown 2010); M.A. (Northwestern 2011) [2016]
- LAURENCE J. ZWIEBEL, Cornelius Vanderbilt Chair in Biological Sciences; Professor of Biological Sciences; Professor of Pharmacology  
B.S. (Stony Brook 1980); M.S. (Michigan 1982); Ph.D. (Brandeis 1992) [1998]





# Blair School of Music

**B**

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## Music at Vanderbilt

**B**LAIR School of Music serves as the focal point at Vanderbilt for the study of music as a human endeavor and as a performing art. The school contributes to the quality of life at the university through concerts, lectures, and recitals by faculty, students, and visiting artists, scholars, and composers, and through course offerings in performance, music literature/history, composition, and theory. In an age of increasing technology and social complexity, music offers to persons of all ages a vital medium for the expression of the human spirit.

The Blair School has been an integral part of Nashville's musical environment since its founding in 1964 by the Justin and Valere Potter Foundation through a bequest of Valere Blair Potter. In 1981 the school was merged with Vanderbilt following the university's decision to develop an excellent program in music. Studies leading to the professional Bachelor of Music degree in performance were initiated in 1986.

The degree program also includes majors in composition and musical arts. The major in composition emphasizes analytical skills as well as the development of students' creativity. The major in musical arts lays a solid foundation in the art of music, with equal preparation in the three basic disciplines of performance, theory, and music literature/history. The musical arts major also forms the basis for a five-year program in teacher education offered cooperatively with Peabody College. Students in this curriculum can earn the B.Mus. degree in four years and the M.Ed. and teacher licensure for instrumental/general or vocal/general music in the fifth year (June–May). All Blair degree programs are accredited by the National Association of Schools of Music (NASM).

A non-professional 31-hour liberal arts music major makes it possible for students outside the Blair School to choose music as a second major. Students in other schools and colleges of the university also may pursue a minor in music, music composition, music history, or music performance. And Blair offers a remarkable variety of electives for students who wish to enrich their studies with credit in music courses, ensembles, or performance instruction, or to select music as an extracurricular activity.

Blair School of Music is home to internationally known faculty soloists and ensembles, and Blair's performers, composers, and musicologists are among the most respected in their fields. Members of the faculty ensembles (Blair String Quartet, Blair Woodwind Quintet, Blair Brass Quintet, and Blakemore Trio) provide private instruction and coach chamber music ensembles and performance classes. The faculty's dedication to teaching and a low student/faculty ratio provide students the personal attention that fosters maximum musical growth and understanding. The school is committed to its goal of developing students who are among the most articulate, culturally aware, and artistically sensitive of any graduates in the country.

### Facilities

The Blair building incorporates innovative developments in acoustical design and engineering. It contains teaching studios and faculty offices, classrooms, rehearsal halls, practice rooms, library, administrative offices, MIDI piano labs with individual

computer workstations, and concert venues. The 272-seat Steve and Judy Turner Recital Hall is the locus for student recitals and concerts and master classes by faculty members and visiting artists held on a regular basis. It also houses the Dobson Organ Opus 92 (2014), designed in the tradition of eighteenth-century eastern German organs not unlike those Bach knew, with additions and accommodations for twenty-first century use. Opened in spring 2002, the 609-seat Ingram Hall garnered immediate acclaim for its superb acoustics, its visual beauty, and its enhancement of the school's ability to host and produce orchestra, opera, and other major concert events.

The Anne Potter Wilson Music Library is a division of the Jean and Alexander Heard Library system. The collection, begun in 1947, was moved from Peabody College to its new and permanent home at Blair in the summer of 1985. Named to honor Anne Potter Wilson by the Vanderbilt Board of Trust in 1987, the 8,000-square-foot library holds more than 95,000 books, scores, sound and video recordings, and subscriptions to journals and online music databases. It is equipped with a seminar room, listening and viewing stations, computer workstations, and study facilities. Music librarians and staff are available to answer reference inquiries and to assist users with locating resources for performance, study, or instruction.

### Accreditation

All programs leading to the B.Mus. degree are accredited by the National Association of Schools of Music, 11250 Roger Bacon Drive, Suite 21, Reston, VA 20190-5248; telephone: (703) 437-0700.

## Classes for the General Student

The Blair School of Music welcomes the general student into its classes and studios. A large number of courses are designed specifically for non-majors. Many classes are held in Sarratt Cinema, Alumni Hall, and other central campus locations. Non-majors may also participate in any and all music major courses for which they are qualified.

A wide variety of music courses fulfill liberal arts core requirements for undergraduates in the College of Arts and Science, the School of Engineering, and Peabody College. These are listed by course numbers in each school's/college's section of this catalog, where requirements outlining Arts and Science AXLE, Engineering liberal arts core, or Peabody liberal education core requirements are given. Requirements and the courses which fulfill them differ for each Vanderbilt school.

Courses of particular interest to the general student are:

### *First-Year Writing Seminars\**

Music and Global Health	MUSL 1111 [W, INT]
Music and Modernism	MUSL 1111 [W, HCA]
Shakespeare and Music	MUSL 1111 [W, HCA]
Music Identity and Diversity	MUSL 1111 [W, P]

### *Music Composition and Theory*

Techniques of Choral	
Composition	MUTH 3130
Music Theory (Survey of)	MUTH 1200-1210

Nashville Number System, The	MUTH 1130
Songwriting and Elements of Music Theory	MUTH 1120
Songwriting II	MUTH 1125

*Music Literature and History\**

African Music	MUSL 1105 [INT]
American Music	MUSL 2600 [US]
American Popular Music	MUSL 1600 [US]
Blues, The	MUSL 1630 [US]
Choral Music (Survey of)	MUSL 1230 [HCA]
Concerto, The	MUSL 1210 [HCA]
Country Music	MUSL 1640 [US]
Exploring the Film Soundtrack Introduction to Music Literature	MUSL 1200 [HCA]
Jazz (Survey of)	MUSL 1620 [US]
Love and Death in Music	MUSL 1310 [HCA]
Music City Museums and Memorabilia	MUSL 1660 [HCA]
Music, Gender, and Sexuality	MUSL 3150 [P]
Music, Identity, and Diversity	MUSL 2150 [P]
Music in Latin America and the Caribbean	MUSL 2110 [INT]
Music of the South	MUSL 2610 [US]
Music, the Arts, and Ideas	MUSL 1300 [HCA]
Musical Theatre in America	MUSL 1610 [HCA]
Opera	MUSL 3220, 3221 [HCA]
Rock Music (History of)	MUSL 1650 [HCA]
Symphony, The	MUSL 1220 [HCA]
Women and Music	MUSL 3155 [P]
Women and Rock Music	MUSL 3160 [HCA]
World Music	MUSL 1100 [INT]

*Other Courses*

Building Communities Through Music and the Arts	MENT 1130
Arts Administration	MENT 1135
Creating Mission-Driven Arts and Social Programming	MENT 1140
Business of Music, The	MENT 1120
Music Internships	MENT 3880, 3881, 3882

\*The bracketed letters indicate categories of the Arts and Science AXLE curriculum, which may also be verified in the Arts and Science section of the catalog. These designations are as follows: Humanities and the Creative Arts [HCA]; International Cultures [INT]; History and Culture of the United States [US]; Social and Behavioral Sciences [SBS]; and Perspectives [P].

*Composition/Theory, Musicianship, and Keyboard Harmony*

Courses designed for the general university student (MUTH 1120, 1125, 1130, 1200, 1210) focus on the recognition of stylistic and structural patterns. This skill enhances the non-technical listener's awareness—both analytical and affective—of creative expression in music.

The music theory and musicianship sequence (MUTH 2100-2400; MUSC 2100-2400) introduces serious students of music, whether majors or not, to the principles of harmony, voice-leading, counterpoint, structure, and analytical/compositional

techniques in a variety of historical styles; further, it fosters the all-important skills of hearing tonal relationships with facility and of communicating orally the structures and materials of music.

*Ensembles*

The Blair School of Music sponsors several major performing ensembles, including the Vanderbilt Symphonic Choir, Vanderbilt Chorale, Orchestra, Wind Ensemble, Opera Theatre, and Jazz Band. Other non-western and vernacular ensembles, such as the African Performing Ensemble and the Steel Drum/Pan Ensemble, are also available for credit. A large number of smaller ensembles and chamber music groups also exist, offering students a wide variety of experiences.

*Auditions.* Auditions for the major performing ensembles are held at the beginning of each semester. Audition information can be found on the Blair School of Music website. Students must audition every semester unless excused. Assignment is at the discretion of the director. Openings at mid-year are not guaranteed. Students need the approval of the appropriate faculty chamber music coordinator before enrolling in chamber music; if participation has not been discussed with the coach, students may register tentatively for the “to be assigned” section of chamber music. Openings are not guaranteed.

*Credit.* Students may register for course credit. Audit status or registration for zero hours may be possible with permission of the director.

*Music Literature and History*

Courses in the literature and history of music are designed to develop students' understanding of music within the prevailing social and cultural contexts; to establish a framework for critical evaluation of music and musical practices; to achieve a working familiarity with recognized, or at least representative, masterworks of musical literature; to develop students' ability to speak articulately about the styles and substance of music; and to equip students with analytic and literary skills and with a working knowledge of the bibliography of music.

*Performance*

Performance instruction in individual or group settings is available for university credit for an additional fee. Private instruction is offered in all orchestral instruments and in piano, organ, guitar, dulcimer, mandolin, saxophone, euphonium, fiddle, banjo, steel drum/pan, and voice. Credit is flexible, but beginning students may register for only 1 credit hour. Students contract with the private instructor regarding lesson length and practice hours and can earn either 1 or 2 credit hours each semester. Students in the School of Engineering can count 3 hours of performance instruction (or ensembles) towards liberal arts core requirements. For others, performance is elective credit. Group instruction is offered in piano, guitar, steel pan/drum, and percussion; groups have maximum of six students and earn 1 credit hour.

**Group Performance Instruction: Non-Major**

Group instruction is designed for beginning students with emphasis on basic technique, rhythm, tone, and musical interpretation. Groups are limited to six students.

*Registration.* New students must interview with the appropriate faculty member before finalizing registration. Instructions are given in the online registration system.

*Fees.* Music fees are in addition to tuition charges and are not refundable after the change period. The cost for group instruction is \$775.00 per semester for one 50-minute lesson weekly. (Fees, set annually by the Board of Trust, are subject to review and change without further notice.)

### Individual Performance Instruction

Individual instruction is focused on the art and practice of an instrument or voice, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Blair offers collegiate-level performance instruction for non-majors at the 1100 level. 2100-, 2200-, 4100- and 4200-level courses are open only to B.Mus. students.

*Registration.* New students must interview with the appropriate faculty member before finalizing registration. Information is available in YES. Enrollments are limited.

*Credit.* University students enrolled in individual instruction may earn 1 or 2 credit hours depending on lesson length and practice commitment.

- 30-minute or 45-minute lessons with 5 hours minimum weekly practice earn 1 credit hour.
- 60-minute lessons with 10 hours minimum weekly practice earn 2 credit hours.
- Beginners may not register for more than 1 hour of credit.

*Fees.* Music fees are charged in addition to regular tuition, and are not refundable after the change period. Students receiving need-based financial aid may request that music fees be considered in their financial aid package. Students with a declared second major or minor in music will be charged approximately one-half the music performance instruction fee. For instrument courses numbered 1100, fees per semester are as follows:

	Elective Credit / Non-Blair Students	2nd majors and minors receive
One 30-minute lesson weekly	\$1,000	50% discount
One 45-minute lesson weekly	\$1,405	
One 60-minute lesson weekly	\$1,760	

Fees, set annually by the Board of Trust, are subject to review and change without further notice.

### Music Minors

Students may elect one of four minors: music, music composition, music history, or music performance. Formal admission to the general minor, the performance minor, or the second major is contingent upon a performance audition that meets departmental standards for the intermediate or advanced level of study. Following interviews with the appropriate department, students plan their studies with Blair advisers. Contact information and declaration paperwork are available online: [blair.vanderbilt.edu](http://blair.vanderbilt.edu). Students must complete all requirements for the music minors with standard grading basis (that is, not Pass/Fail).

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### Music Minor. 24 or 25 hours.

*Music Theory.* 6 or 7 hours.

MUTH 1200-1210; or MUTH 2100-MUSC 2100 and  
MUTH 2200-MUSC 2200

*Music Literature/History.* 12 hours.

MUSL 2200W or 1200

One course chosen from: MUTH 3890, MUSL 1111-02 (Shakespeare and Music), 1210, 1220, 1230, 3220-3240, and, with approval of department chair, 3890

One course chosen from: MUSL 1111-01 (Music and Global Health), MUSL 1111-03 (Music and Modernism), MUSL 1111-04 (Music, Identity, and Diversity), 1100, 1105, 3155, 3150, 3220-3240, 2110, 2150, 2610, and 3890

One course chosen from: MUTH 3890 or any MUSL course

*Performance.* 4 hours.

Individual performance instruction in a single instrument for at least 4 semesters (any orchestral instrument, piano, organ, guitar, saxophone, euphonium, voice, or JAZZ 1100).

Students must meet minimum standards and obtain the approval of the appropriate department chair (brass/percussion, guitar/harp, keyboard, strings, voice, woodwinds, jazz). Declaration forms are available in the Blair office and online at [blair.vanderbilt.edu/academics](http://blair.vanderbilt.edu/academics).

*Ensemble.* 2 hours (2 different semesters).

Participation for two semesters in an appropriate performing ensemble, after consultation with the minor adviser.

### Music History Minor. 18 or 19 hours.

*Music Theory.* 6 or 7 hours.

MUTH 1200-1210; or MUTH 2100-MUSC 2100 and  
MUTH 2200-MUSC 2200

*Music Literature/History.* 12 hours.

MUSL 2100, MUSL 2200W\*, one course from 3220-3240, and 3100.

\*Students who have completed MUSL 1200 must substitute another course for MUSL 2200W, selected from MUSL 1610, 1210, 1220, 1230, 2600, 1620, 1600, 1630, 1640, 1650, 1100, 1105, 1300, 3155, 3150, 3220-3240, 2110, 3160, 2150, 2610, 2320, 1660, or 3890.

### Music Composition Minor. 26 hours.

*Music Theory.* 13 hours.

MUTH 2100, 2200, 2300, 2400; MUSC 2100, 2200

*Music Literature/History.* 6 hours.

MUSL 1200 or 2200W, 3100

*Composition.* 7 hours.

COMP 1100; COMP 2100 (4 semesters)

Formal admission into the music composition minor requires departmental approval. Applicants should submit a composition portfolio consisting of three completed works, with scores and recordings (MIDI is acceptable) to the Composition and Theory Department Chair.

### Music Performance Minor. 25 or 26 hours.

*Music Theory.* 6 or 7 hours.

MUTH 1200-1210; or MUTH 2100-MUSC 2100 and  
MUTH 2200-MUSC 2200

*Music Literature/History. 6 hours.*

MUSL 2200W or 1200

One course chosen from MUSL 3220-3240

*Performance. 11 hours.*

Individual instruction in a single instrument for at least 6 semesters (any orchestral instrument, piano, organ, guitar, saxophone, euphonium, or voice.)

Students must meet minimum performance standards for admission to the program, earning a total of 11 hours. Repertoire information and declaration forms are available in the Blair office and online at [blair.vanderbilt.edu/academics](http://blair.vanderbilt.edu/academics).

*Ensemble. 2 hours (two different semesters).*

Participation for two semesters in an appropriate performing ensemble, as assigned following audition. String, woodwind, brass, percussion, and harp students must audition for MUSE 1010, Instrumental Ensemble. Guitar and voice students must audition for MUSE 1020, Symphonic Choir. Keyboard students must participate as a pianist for one semester in MUSE 2300, 2310, 2320, 2330, 2210, 2230, or 2272; or in 1010, 1020, 1030, 2120, or 1140, contingent upon permission of the ensemble instructor and the piano instructor.

audition for MUSE 1010, Instrumental Ensemble. Guitar and voice students must audition for MUSE 1020, Symphonic Choir. Keyboard students must participate as a pianist for one semester in MUSE 2300, 2310, 2320, 2330, 2210, 2230, or 2272; or in 1010, 1020, 1030, 2120, or 1140, contingent upon permission of the ensemble instructor and the piano instructor.

*Elective. 2–3 hours.*

One course in music theory, literature/history, or conducting, chosen from MUTH 2400, 3130, 3110, 3210, 3200, 3120, 3140, 3160, 3890; any MUSL; MCON 3000.

**Music as a Second Major**

Blair offers a non-professional liberal arts major in music that requires a minimum of 31 hours. Designed jointly by Blair and the College of Arts and Science, it is also available to Peabody and Engineering students as a second major. Following interviews with the appropriate performance department, students plan their studies with Blair adviser Professor Carl Smith, coordinator of the program. Contact information and declaration paperwork are available online: [blair.vanderbilt.edu](http://blair.vanderbilt.edu). Students must complete all requirements for the music as a second major with standard grading basis (that is, not Pass/Fail).

**Music Major (Second Major). 31 hours.***Music Theory. 12 hours.*

MUTH 2100-MUSC 2100, MUTH 2200-MUSC 2200,

MUTH 2300-MUSC 2300, and MUSC 2400.

*Music Literature/History. 9 hours.*

MUSL 2100, 2200W\*, 3100.

\*Students who have completed MUSL 1200 must take an additional course instead of MUSL 2200W, selected from MUSL 3220-3240.

*Individual Performance Instruction. 6 hours.*

Six semesters of study in any orchestral instrument, piano, organ, guitar, saxophone, euphonium, or voice.

Students must meet minimum performance standards for admission to the program, with the required 6 hours at a level beyond that minimum. Representative repertoire lists reflecting minimum performance standards and required declaration forms are available online at [blair.vanderbilt.edu/academics](http://blair.vanderbilt.edu/academics) or from either the Blair office or Professor Carl Smith, coordinator of the program.

*Ensemble. 2 hours (two different semesters).*

Participation for two semesters in an appropriate performing ensemble, as assigned following audition. String, woodwind, brass, percussion, and harp students must

# The Degree Program

The bachelor of music degree program includes four different majors: performance, composition, musical arts, and the musical arts/teacher education track. The performance major is available in any orchestral instrument, piano, organ, classical guitar, saxophone, euphonium, and voice. The composition major emphasizes both the creation and analysis of music. The musical arts major provides a solid foundation in the art of music and includes equal preparation in the three basic disciplines—theory, literature/history, and performance. Students, excepting musical arts/teacher education majors, may complete an optional concentration in collaborative arts, composition, jazz, literature/history, pedagogy, or theory. The musical arts/teacher education program, a five-year curriculum jointly developed with Peabody College, is for students interested in earning the master of education degree and teacher licensure in addition to the bachelor of music degree. Through a dual B.Mus./MBA program, interested students in the musical arts major have an opportunity to compress both the bachelor of music at the Blair School of Music and the master of business administration at the Owen Graduate School of Management into ten semesters in residence. Application for this program is made early in the fall semester of the junior year.

## Bachelor of Music Degree Requirements

All bachelor of music degree candidates complete a program designed to ensure an intense, yet broadly-based, understanding of the discipline of music, focused on the skills and knowledge students will need to succeed as informed musicians of the twenty-first century. Each student must complete 126 credit hours, including 80 hours in music. The music core (41 credit hours minimum) includes music theory, musicianship, keyboard harmony, music literature, conducting, and ensemble. Each major has additional specific requirements, including performance instruction and other music courses (to fulfill 80 hours). Liberal arts core requirements (minimum of 30 hours) include English, the humanities, courses chosen from history or social science, mathematics or natural science, and academic electives. Students may take free electives to total 126 hours. Sample curriculum plans are in the *Blair Student Handbook* at [blair.vanderbilt.edu/academics](http://blair.vanderbilt.edu/academics).

### Requirements by Major Area

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

#### BRASS PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
MUTH 2100, 2200, 2300, 2400  
MUSC 2100, 2200, 2300, 2400  
MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
MCON 3000

ENSEMBLE. 10 hours minimum  
MUSE 1010 (every semester in residence); MUSE 1150, 2210, 2250 or 2260 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)  
TRPT, HORN, TROM, EUPH, or TUBA 2200; 4200

RECITAL ATTENDANCE. No credit  
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. TRPT, HORN, TROM, or TUBA 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MUSO 1120, MREP 2110

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

#### COMPOSITION

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
MUTH 2100, 2200, 2300, 2400  
MUSC 2100, 2200, 2300, 2400  
MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
MCON 3000

ENSEMBLE. 8 hours minimum (every semester in residence)  
Eight semesters selected with the adviser's approval. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 6 hours, 6 semesters  
3 semesters in any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, or voice (1100 level); 2 semesters chosen from any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, or voice or MUED 1010-1040; 1 semester chosen from any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, voice (1100 level), or JAZZ 1100.

RECITAL ATTENDANCE. No credit  
MUSO 1000 (every semester in residence except penultimate or final semester)

COMPOSITION. COMP 1100, 1150, 2200, 2300, 2400, 4300-4303  
Students rotate instructors as assigned for COMP 1150-2400 to gain experience with 4 different members of the department. Students may select one or more instructors of choice in their junior and senior years.

OTHER MUSIC. COMP 1000 (every semester in residence); MUTH 3210, COMP 3978, 4970

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. Must include one year of a foreign language, normally French, German, or Italian. Another language appropriate to the student's musical pursuits may be chosen with approval of composition/ theory department. Two (2) courses chosen from: 2000-level or higher art history, 2000-level or higher English, 2000-level or higher philosophy; a total of 33 hours, rather than 30, in liberal arts (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**GUITAR PERFORMANCE**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
 MUTH 2100, 2200, 2300, 2400  
 MUSC 2100, 2200, 2300, 2400  
 MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

ENSEMBLE. 8 hours minimum (every semester in residence)

MUSE 1020 or 2120 (two semesters), 1120 (two semesters), and 2330, 1120, or 2210 (four semesters). Students must audition for symphonic choir each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)

GTR 2200; 4200

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. GTR 1000 (every semester in residence), MUSO 3970, 4970

OTHER MUSIC. MREP 3300, MPED 3100

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**HARP PERFORMANCE**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
 MUTH 2100, 2200, 2300, 2400  
 MUSC 2100, 2200, 2300, 2400  
 MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

ENSEMBLE. 10 hours minimum

MUSE 1010 (every semester in residence); MUSE 1130 or 2210 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)

HARP 2200; 4200

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. MUSO 3970, 4970

OTHER MUSIC. MREP 2130

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**MUSICAL ARTS**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
 MUTH 2100, 2200, 2300, 2400  
 MUSC 2100, 2200, 2300, 2400  
 MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

ENSEMBLE. 8-10 hours (every semester in residence)

Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

*Strings, woodwinds, brass, harp, percussion*—(10 hours minimum) Five semesters MUSE 1010 (including four semesters of MUSE 1150, 1160, 1130, 1140, 2220, 2210, 2230, 2240, 2250, or 2260, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career); and three semesters ensemble of choice.

*Guitar*—(8 hours) Two semesters MUSE 1020 or 2120, two semesters 1120, one semester 1020, 2120, 2330, 1120, or 2210, and three semesters ensemble of choice.

*Organ*—(8 hours) Three semesters of conducted choral ensemble, one semester of MUSE 2300, one semester of 2320, one semester of 2310, and two semesters ensemble of choice.

*Piano*—(8 hours) One semester chosen from MUSE 1020, 2120, 1010, 1030, or other approved conducted choir; one semester of 2300; three semesters of 2320, 2330, 2210, 2310, or 2230; three semesters ensemble of choice with adviser's approval.

*Voice*—(8 hours) Eight semesters MUSE 1020 or 2120 (or 2330 if demonstrated schedule conflict exists); students in MUSE 1030 are eligible for 0.5 credit section of 1020, 2120, or 2330.

*Composition*—(8 hours) Eight semesters, selected with adviser's approval

INDIVIDUAL PERFORMANCE or COMPOSITION (for composition students) INSTRUCTION. 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

COMPOSITION/THEORY, LITERATURE/HISTORY. 9-12 hours. Four courses selected from MUSL and MUTH 3000- or 4000-level courses in addition to the MUSL and MUTH core courses, including at least 3 hours MUSL, 2-3 hours MUTH, and 4-6 hours MUSL or MUTH

PERFORMANCE. Performance class (or composition studio class for composers) every semester in residence if offered (BASS 1000, BSSN 1000, CLAR 1000, CLLO 1000, COMP 1000, FLUT 1000, GTR 1000, HORN 1000, OBOE 1000, PERC 1000, PIAN 1000, SAX 1000, TROM 1000, TRPT 1000, TUBA 1000, VLA 1000, VLN 1000, VOIC 1000)

OTHER MUSIC. 3 hours. MUSO 1400, 1410, 1420 (required for voice only); 4 hours of 1100-level performance instruction or MUED 1010-1040 and 3 hours COMP 1100 (required for composition only)

MUSIC ELECTIVES. To complete a minimum of 80 hours in music.

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**MUSICAL ARTS/TEACHER EDUCATION, INSTRUMENTAL/GENERAL**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours

MUTH 2100, 2200, 2300, 2400

MUSC 2100, 2200, 2300, 2400

MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

ENSEMBLE. 9 hours minimum (every semester in residence) Instrumental ensemble and co-requisite chamber music are required both semesters of freshman year, and a total of six semesters of conducted ensemble (chosen from MUSE 1000, 1010, 1020, or 2120) and two semesters of small ensemble is required. Instrumentalists must have experience in orchestra, wind ensemble, jazz ensemble (as appropriate), and chamber music, with ensemble enrollment required every semester and every module in residence. Pianists must be accepted in MUSE 1010, 1020, or 2120 by the beginning of the second semester. During study abroad, a student could choose to waive an ensemble of choice. Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors.

INDIVIDUAL PERFORMANCE INSTRUCTION. 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

COMPOSITION/THEORY. MUTH 3110, COMP 1100

LITERATURE/HISTORY. MUSL 2600; choice of MUSL 1110, 3155, 3150, 2110, or 2150; choice of MUSL 1610, 1300, or 3220-3240.

PERFORMANCE. Performance class on primary instrument (except harp) every semester. Secondary instrument(s) three semesters (may include Intro to Guitar GTR 1010 or Classroom Instruments MUED 1050, but no more than 1 semester in the area of the major instrument; may include voice). Secondary Instrument Lab MUED 1070 one semester. Child and Adolescent Voices MUED 1060. Senior Recital MUSO 4970.

OTHER MUSIC. Instrumental Conducting MCON 3010.

Note: Conducting study must include two different professors.

TEACHING. Class Instruments MUED 1010, 1020, 1030, 1040. Practica in Music Teaching MUED 3870, 3871, 3872. Two seminars chosen from MUED 2110-2170.

LIBERAL ARTS. 30 hours (and 9 hours listed above in Literature/History)

*English/Writing:* 6 hours, including MUSL 2200W and choice of AP/IB English credit, any ENGL, or any writing course (any W in the English language, any 1111, or ENGL 1100; must be from outside of music).

*Humanities:* 6 hours, including MUSL 2100 and 3 hours in art history, humanities, language, philosophy, or religious studies. (6 additional hours of humanities credit are counted above in Literature/History.)

*History and Social Science:* 6 hours, including 3 hours American

History and 3 hours in a social science discipline other than history chosen from Anthropology, Economics, Political Science or Sociology. (3 additional hours of history and social science credit are counted above in Literature/History.)

*Mathematics and Natural Science:* 6 or 7 hours, including 3 hours math, chosen from statistics (ECON 1500, MATH 1010 or 1011, PSY-PC 2110) or calculus (MATH 1100, 1200, 1201, 1300, 1301, 2200, 2300, 2500, 2501); and 3 or 4 hours any science course with a lab.

*Academic Electives:* 6 hours, specifically EDUC 1220 and SPED 1210. (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**MUSICAL ARTS/TEACHER EDUCATION, VOCAL/GENERAL**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours

MUTH 2100, 2200, 2300, 2400

MUSC 2100, 2200, 2300, 2400

MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

ENSEMBLE. 8 hours minimum (every semester in residence) 6 semesters large ensemble (chosen from MUSE 1000, 1010, 1020, or 2120) and 2 semesters small ensemble. Pianists, vocalists, and guitarists must have experience accompanying. All students must have ensemble experience on their secondary instrument. Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

COMPOSITION/THEORY. COMP 1100 and choice of MUTH 3130 or MUTH 3110

LITERATURE/HISTORY. MUSL 2600; choice of MUSL 1110, 3155, 3150, 2110, or 2150; choice of MUSL 1610, 1300, or 3220-3240 .

PERFORMANCE. Performance class on primary instrument every semester if offered. Secondary instrument 4 semesters (voice for pianists and organists; piano for singers; voice or piano for guitarists or other instrumentalists). MUED 1060 Child and Adolescent Voices (for pianists, guitarists, other instrumentalists only; voice majors exempt). Intro to Guitar GTR 1010 (guitar majors exempt). Senior Recital MUSO 4970.

OTHER MUSIC. MCON 3020 Choral Conducting. MUSO 1400 Diction for Singers: English and Italian; MUSO 1410 Diction for Singers: German; MUSO 1420 Diction for Singers: French (required for voice majors only; it is recommended that MUSO 1400, MUSO 1410 and MUSO 1420 be taken in sequence in the first three semesters).

TEACHING. Teaching: Intro to Classroom Instruments MUED 1050; Practica in Music Teaching MUED 3870, 3871, 3872. Two seminars chosen from MUED 2110-2170.

LIBERAL ARTS. 30 hours (and 9 hours listed above in Literature/History)

*English/Writing:* 6 hours, including MUSL 2200W and choice of AP/IB English credit, any ENGL, or any writing course (any W in the



English language, any 1111, or ENGL 1100; must be from outside of music).

*Humanities:* 6 hours, including MUSL 2100 and 3 hours in art history, humanities, language, philosophy, or religious studies. (6 additional hours of humanities credit are counted above in Literature/History.)

*History and Social Science:* 6 hours, including 3 hours American History and 3 hours in a social science discipline other than history chosen from Anthropology, Economics, Political Science or Sociology. (3 additional hours of history and social science credit are counted above in Literature/History.)

*Mathematics and Natural Science:* 6 or 7 hours, including 3 hours math, chosen from statistics (ECON 1500, MATH 1010 or 1011, PSY-PC 2110) or calculus (MATH 1100, 1200, 1201, 1300, 1301, 2200, 2300, 2500, 2501); and 3 or 4 hours any science course with a lab.

*Academic Electives:* 6 hours, specifically EDUC 1220 and SPED 1210. (see full requirements below)

FREE ELECTIVES. To complete 126 hours

### ORGAN PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
MUTH 2100, 2200, 2300, 2400  
MUSC 2100, 2200, 2300, 2400  
MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
MCON 3000

ENSEMBLE. 8 hours minimum (every semester in residence)  
MUSE 1010 or 2120 (four semesters); 2320 (one semester); 2320, 2330, 2210 or 2310 (one semester); and ensemble of choice (two semesters). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)  
ORGN 2200; 4200

RECITAL ATTENDANCE. No credit  
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. MUSO 3970, 4970

OTHER MUSIC. Organ Literature and Organ Pedagogy

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

### PERCUSSION PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
MUTH 2100, 2200, 2300, 2400  
MUSC 2100, 2200, 2300, 2400  
MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
MCON 3000

ENSEMBLE. 10 hours minimum  
MUSE 1010 (every semester in residence); MUSE 1140, 2220, or 2210 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)  
PERC 2200; 4200

RECITAL ATTENDANCE. No credit  
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. PERC 1000 (every semester in residence), MUSO 3970, 4970

OTHER MUSIC. MUSO 1130, MREP 2120 or 2121

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

### PIANO PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
MUTH 2100, 2200, 2300, 2400  
MUSC 2100, 2200, 2300, 2400  
MUKH 2133 and 2134

MUSIC LITERATURE/HISTORY. 12 hours  
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
MCON 3000

ENSEMBLE. 8 hours minimum (every semester in residence)  
MUSE 2300 (one semester), 2320 (one semester), 2310 (one semester), conducted ensemble 1020, 2120, 1010, 1030, or other approved conducted choir (one semester), and choice of 1010, 1020, 1030, 1140, 1310, 2120, 2320, 2330, 2210, 2310, or 2230 (four semesters). Participation in 1010 or 1030 is contingent upon approval of ensemble conductor and piano instructor. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)  
PIAN 2200; 4200

RECITAL ATTENDANCE. No credit  
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. PIAN 1000 (every semester in residence), MUSO 3970, 4970

OTHER MUSIC. MREP 3310, 3311, MPED 3110

LIBERAL ARTS CORE. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**STRING PERFORMANCE**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
 MUTH 2100, 2200, 2300, 2400  
 MUSC 2100, 2200, 2300, 2400  
 MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
 MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
 MCON 3000

ENSEMBLE. 10 hours minimum  
 MUSE 1010 (every semester in residence); MUSE 2210, 2230, or 2240 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). All students except double bass majors must have experience in string quartet (MUSE 2240). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)  
 VLN, VLA, CLLO, or BASS 2200, 4200

RECITAL ATTENDANCE. No credit  
 MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. VLN, VLA, CLLO, or BASS 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MREP 2130

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**VOICE PERFORMANCE**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
 MUTH 2100, 2200, 2300, 2400  
 MUSC 2100, 2200, 2300, 2400  
 MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
 MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
 MCON 3000

ENSEMBLE. 8 hours minimum (every semester in residence)  
 Eight semesters MUSE 1020 or 2120 (or 2330 if demonstrated schedule conflict exists); students in MUSE 1030 are eligible for 0.5 credit section of 1020, 2120, or 2330. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 28 hours, 8 semesters (every semester in residence)  
 VOIC 2200; 4200

RECITAL ATTENDANCE. No credit  
 MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. PIAN 1100 (two semesters); VOIC 1000 (every semester in residence);  
 MUSO 3970, 4970

OTHER MUSIC. MUSO 1400, 1410, 1420, MREP 3330, MPED 3130

LIBERAL ARTS. 30 hours, including 6-10 hours (two semesters) chosen from French, German, and Italian (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**WOODWIND PERFORMANCE**

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours  
 MUTH 2100, 2200, 2300, 2400  
 MUSC 2100, 2200, 2300, 2400  
 MUKH 1131, 1132, 1133, and 1134

MUSIC LITERATURE/HISTORY. 12 hours  
 MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours  
 MCON 3000

ENSEMBLE. 10 hours minimum  
 MUSE 1010 (every semester in residence); MUSE 1160, 2210, or 2260 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)  
 FLUT, OBOE, CLAR, BSSN, SAX 2200; 4200

RECITAL ATTENDANCE. No credit  
 MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. FLUT, OBOE, CLAR, BSSN, SAX 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MREP 2140 (flute, oboe, clarinet, and bassoon) or MREP 2141 (saxophone); MPED 3140 (section appropriate for major instrument)

LIBERAL ARTS CORE. 30 hours (see full requirements below)

FREE ELECTIVES. To complete 126 hours

**Liberal Arts Core**

The liberal arts core affords music students the opportunity to develop a broad-based understanding of intellectual endeavors and methods in a variety of disciplines, to explore the interconnectedness of music, arts, and other humanistic pursuits, and to articulate their thinking in clear and effective language. The curriculum, which provides maximum flexibility for each student, requires a minimum of 30 hours (33 hours for composition majors), satisfied through required categories as noted below. Students electing a second major outside of music complete only the Blair liberal arts core; they are not expected to fulfill the core requirements (such as AXLE) of another Vanderbilt school or college. Hours earned toward the Blair liberal arts core may also be counted toward a second major or minor, if appropriate. Students admitted with a deficiency relative to high school credits must plan their liberal arts work to overcome the deficiency. 1001 courses do not count for liberal arts core credit.

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## English/writing (6 hours)

Students must complete writing course MUSL 2200W during the first year. A second English/writing course\* of at least three credit hours, chosen from:

- Advanced Placement or International Baccalaureate credits in English/ Writing (consult the chapter on Admission for current policy)
- First year writing seminars (1111) in any discipline
- Writing courses in the English language in any discipline, designated by W in the course number.
- English: all courses
- Communication Studies: 1500, 1850
- MUSL 2330

For musical arts/teacher education majors, an English/writing course outside of music is required.

\*Students with a score of 1500 on the Writing and Critical Reading portions of the SAT with a minimum score of 760 in the Writing portion may exempt the second English/writing course, substituting 3 hours of any academic elective. Students who do not present a combined score of 1220 on the Writing and Critical Reading sections of the SAT test with a minimum score of 500 in each, or a score of 27 on the English portion combined with a score of 19 on the Writing portion of the ACT test, must enroll in English 1100 in the first semester.

## Humanities (9 hours)

### HUMANITIES REQUIREMENTS

MUSL 2100. Students should complete this required course during the first year.

Six additional hours of humanities electives (listed below)

For composition majors, 15 hours minimum, including MUSL 2100: one year of French, German, or Italian; and 6 hours chosen from 2000-level or higher art history, 2000-level or higher English, and 2000-level or higher philosophy.

For musical arts/teacher education majors, 6 hours are required, including MUSL 2100 and 3 hours in art history, humanities, language, philosophy, or religious studies. (6 additional hours of humanities credit are counted in the Music Literature/History category of the major area requirements, above.)

For vocal performance majors, 9-13 hours: MUSL 2100 and 6-10 hours (two semesters) chosen from French, German, and Italian.

### HUMANITIES ELECTIVES

African American and Diaspora Studies: 1506 and all HCA-designated courses

Anthropology: All HCA-designated courses

Arabic: All courses

Asian Studies: 2100W, 2511, 2512, 2601, 2602, 2611, 3606

Catalan: All courses

Chinese: All courses

Cinema and Media Arts: All courses except W courses

Classics: All, except SBS-designated courses

Comparative Literature: All courses

English: All courses

European Studies: All HCA-designated courses

French: All courses

German: All courses

Greek: All courses

Hebrew: All courses

History of Art: All courses (art studio courses excluded)

Humanities: All courses

Italian: All courses

Japanese: All courses

Jewish Studies: All HCA- and US-designated courses

Latin: All courses

Medicine, Health, and Society: All HCA-designated courses

Music Literature/History: 1610, 1111-02, 1111-03, (Music and Modernism; Shakespeare and Music), 1300, 3155

Philosophy: All courses except 3003 and 1003

Portuguese: All courses

Religious Studies or Divinity School: All courses

Russian: All courses

Spanish: All courses

Theatre: All courses offered for AXLE credit

Women's and Gender Studies: All HCA- and US-designated courses, 2239, 2248

## History, Social Science (3 hours)

For musical arts/teacher education majors, 6 hours History and Social Science are required: 3 hours American History chosen from HIST 1390, 1400, 1410, 1420, 1440, 1660, 1690, 1730, 1740, 2580, 2590, 2610, 2620, 2630, 2640, 2650, 2690, 2700, 2710 and AP credit in American History; and 3 hours in a social science discipline other than history chosen from Anthropology, Economics, Political Science or Sociology. (3 additional hours of history and social science credit are counted in the Music Literature/History category of the major area requirements, above.)

### HISTORY

Classics: only SBS-designated courses

History: All courses

Music Literature/History: 1111-01 (Music and Global Health), 2600, 1110, 2110, 2150

### SOCIAL SCIENCE

African American and Diaspora Studies: All courses except 1506 and HCA-designated

Anthropology: All courses except HCA-designated

Asian Studies: 2630, 1680, 2560

Communication Studies: All AXLE courses except 1500 and 1850

Economics: All courses offered for AXLE credit

European Studies: All courses except HCA-designated

Human and Organizational Development (Peabody): All 3-hour courses except 1115 and practica

Interdisciplinary Studies: 3001

Jewish Studies: All SBS-, INT-, and P-designated courses

Latin American Studies: All AXLE courses

Medicine, Health, and Society: All P-designated courses and 2510, 3120, 3350

Political Science: All courses

Psychology (A&S): All courses except MNS-designated

Psychology and Human Development (Peabody): All 3-hour courses from 1205-3200 inclusive

Sociology: All courses

Women's and Gender Studies: All courses except HCA- and US-designated and 2239, 2248

## Mathematics, Natural Science (3 hours)

Students who score below 520 on the SAT Reasoning Test Math

Subtest or below 20 on ACT Math Subtest should take MATH 1010

or 1005. For musical arts/teacher education majors, 6 or 7 hours,

including statistics (MATH 1010 or 1011, or PSY-PC 2110 [Peabody])

or calculus (MATH 1100, 1200, 1201, 1300, 1301, 2200, 2300, 2500, 2501); and a science course with a lab.

### MATHEMATICS

Mathematics: All courses

Philosophy: 1003 and 3003

Psychology (Peabody): PSY-PC 2110

### NATURAL SCIENCE

Astronomy: All MNS-designated courses, including accompanying labs

Biological Sciences: All AXLE courses, with corequisite labs

Chemistry: All AXLE courses, with corequisite labs

Earth and Environmental Sciences (Geology): All MNS-designated courses

Neuroscience: All MNS-designated courses

Physics: All MNS-designated courses, including accompanying labs

Psychology: All MNS-designated courses

### Academic Electives (9 hours)

For composition majors, 2–6 hours, to complete 33 hours in liberal arts.  
For musical arts/teacher education majors, 6 hours, specifically Education 1220 and Special Education 1210.

For vocal performance majors, 5–9 hours to total 30 hours in liberal arts.  
Academic electives, drawn from courses earning 3 or more credits, may include:

- Any course listed in the Liberal Arts Core
- Non-music courses in American studies, computer science, engineering science, financial economics, managerial studies, human and organizational development
- Any course in the Divinity School

Practicums and internships may not count as academic electives.

### Free electives (sufficient to complete 126 hours)

Any course in any Vanderbilt school.

## Minor Area and Concentration Requirements

Concentrations and the minor in a second instrument are open to bachelor of music degree students. Honors in Music History and Literature is open to all undergraduates. Deadline to declare a concentration or minor is the fifth day of the first semester of the senior year.

#### CONCENTRATION IN COLLABORATIVE ARTS. 15–21 hours

Literature/History: MUSL 3220 or 3221

Performance: HRPS 1100 (1 hour), MUSO 4970 (1 hour), PIAN 1000 every semester

Other Music: MUSO 1400, 1410, 1420, MREP 3310 or 3311, 3330, MUSO 3850 (2 hours in vocal coaching or chamber music literature)

Ensemble: One semester chosen from MUSE 1020, 2120, 1010, 1030, or other approved conducted choir; one semester of 2300; one semester of 1030 (as apprentice pianist); six semesters of 2320, 2330, 2210, 2310, or 2230; and three semesters ensemble of choice with adviser's approval.

Liberal Arts: Must include 3–5 hours each in two different languages chosen from Italian, German, or French. Students with previous study in one of these must study the other two.

Recommended: MUTH 3110 and MUSL 2330

#### CONCENTRATION IN COMPOSITION. 18 hours minimum

Department approval required for admission to this concentration.

Composition: COMP 1100; choice of two from MUTH 3130, 3110, 3210, 3200, 3120, 3140, 3160, 3170, 3220, or 3890

Composition (elective): 11 hours over a minimum of 4 semesters in COMP 2100

#### CONCENTRATION IN JAZZ. 18 hours minimum

Department approval required for admission into the concentration.

Bachelor of Music students are eligible to audition for a faculty committee no earlier than the end of their first year.

Literature/History: MUSL 1620

Composition/Theory: MUTH 3120; JAZZ 1150

Other Course Work: MUSO 1220; MUED 2140

Performance: JAZZ 1100 (minimum of 4 semesters/4 credit hours); MUSO 4970 (in addition to recital required for major)

Ensemble: MUSE 1310 (minimum of 2 semesters/2 credit hours); MUSE 1320 (minimum of 2 semesters/2 credit hours)

#### CONCENTRATION IN MUSIC LITERATURE/HISTORY. 21–25 hours

Literature/History: 9 elective hours (in addition to 9 hours required for the musical arts major)

Liberal Arts: History 1350, 1360, 6–10 hours (two semesters) of foreign language approved by the department; a total of 34 hours, rather than 30, in liberal arts

#### CONCENTRATION IN PEDAGOGY. 15 or 16 hours

Music Cognition coursework: MUED 2160

Instrumental Literature: Choice of MREP 3310, 3311, 3300, 3330, or MUSO 3850 (in field, 2 hours)

Pedagogy coursework: Choice of MPED 3110, 3100, 3130 or MUSO 3850 (in field, 2 hours), and Pedagogy Practicum MPED 3870 (2 hours)

Pedagogy Internship: MPED 3880 (6 hours)

Senior Recital: MUSO 4970

Liberal Arts: Must include PSY-PC 1250 and 2600 (Peabody courses)

#### CONCENTRATION IN THEORY. 19 hours

Departmental approval required for admission to this concentration.

Composition/Theory: COMP 1100 and 16 hours in MUTH 3210, 3200, 3100, 3120, 3140, 3150, 3160, 3220, or 3890

#### HONORS IN MUSIC LITERATURE AND HISTORY. 9 hours

Departmental approval required for admission to this program; see regulations in the Honors section of the catalog.

Thesis: Departmental approval of a formal thesis prospectus, MUSL 4998–4999 (6 hours), and successful completion of an oral defense.

Course work: One course beyond the MUSL core chosen from MUSL 3150, 3220–3240, 3160, 2610, or 3890 (3 hours)

The MUSL credit hours of this program may double-count in the concentration in music literature/history.

#### MINOR INSTRUMENT. 10 hours

Ensemble: Participation on minor instrument (including voice) in two separate ensembles in addition to major instrument requirement, as assigned (2 hours)

Performance: Minimum of four semesters (8 hours) in a second performance area (any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, voice, or baroque violin or viola) at a level of proficiency required by the department. Consent of instructor and department required. NOTE: Composition majors may satisfy the primary major ensemble and performance instruction requirements with courses also used to fulfill the minor instrument requirements.

## Teacher Education

The Blair School and Peabody College offer a program for students interested in teacher licensure. Students completing this program earn the bachelor of music (B.Mus.) degree, majoring in the musical arts/teacher education track for four years, and the master of education (M.Ed.) degree in the fifth year to complete professional education requirements. During the junior year, application is made to Peabody College. The M.Ed. work requires one calendar year, June–May. Students may elect to work toward licensure in either instrumental/general or vocal/general music, based on their interest and ability to perform at a level sufficient for placement in the appropriate performing ensemble. The curriculum includes a strong music performance emphasis; a solid foundation in music literature, theory, and the liberal arts; undergraduate and graduate courses in psychology and education; and practica (practical experience) four of the five years of study, with two student teaching opportunities in the spring semester of the master's degree work. Practica constitute a wide variety of grade K–12 experiences, including public school, private school, and Blair's precollege programs such as Suzuki strings, Blair Children's Chorus program, and the Nashville Youth Orchestra program. Students complete the same music core requirements as any other B.Mus. candidate. The liberal arts core is adapted to fulfill state licensure requirements. The music electives ordinarily associated with the musical arts curriculum are, for students in the five-year program, devoted to prerequisites for the M.Ed. degree and for the teaching license; thus, there are very few free elective hours in this curriculum.

### Junior Mid-Program Review [Screening I]

All students admitted to this program at matriculation must be formally continued through a process called Junior Mid-Program Review. Criteria for this review are listed below. Students not approved can complete the general musical arts degree.

Faculty evaluation of a student's qualifications for continuation in a teacher education program includes academic, performance, and disposition factors such as the following:

1. Dependability (as evidenced by good attendance and academic performance in classes and practica)
2. Professional and ethical behavior (honesty, acceptance of responsibility, emotional maturity, etc.)
3. Attitude and interpersonal skills (including the ability to work with children and with peers)
4. Academic competence

#### Specific Criteria

1. A minimum cumulative grade point average of 2.500.
2. Successful completion (C- or better) of EDUC 1220 and SPED 1210
3. Successful completion (C- or better) of MUTH 2200, MUSC 2200, MUSL 2200W and MUED 3870.

4. Successful completion (C- or better) of two additional Vanderbilt courses which count towards the Liberal Arts Core.
5. Departmental interview

#### General Criteria

These criteria rest on the professional judgment of appropriate faculty members, who are polled following the student's application for Junior Mid-Program Review.

1. Endorsement by the appropriate faculty that the applicant has demonstrated the academic and musical qualifications expected of Vanderbilt teacher education candidates.
2. Endorsement by the appropriate faculty that the applicant has demonstrated the personal and character traits expected of Vanderbilt teacher education candidates.

#### Procedure for Junior Mid-Program Review [Screening I]

Students apply for continuation in the teacher education program [Screening I] through the Blair program director.

Applications must be submitted in the fall semester of the junior year. Deadline for submitting applications for Junior Mid-Program Review [Screening I] is 1 October. A departmental interview is then held with each candidate to review the student's academic progress and disposition criteria of dependability, professional and ethical behavior, attitude, and interpersonal skills.

B

### Fifth Year Curriculum

SUMMER		Semester hours
EDUC 6510	Principles of ELL Education	3
EDUC 6010	Psychological Foundations of Education	3
EDUC 6310	Teaching in Secondary Schools	3
MUED 5000	Philosophical Foundations and Contemporary Issues in Music Education	3
FALL		
EDUC 6300	Social/Philosophical Aspects of Education	3
EDUC 6320	Practicum in Music Education	1
EDUC 7960	Independent Study in Music (may be taken in summer; requires approval of Blair associate dean)	2
or MUED 5100	Advanced Studies for the Wind Band Conductor	
MUED 5010/5020	Methods and Materials in Teaching Music, Instrumental or Vocal/Choral	3
MUED 5030	Methods and Materials in General Music, PreK through 12	3
SPRING		
EDUC 7974	Internship in Teaching: Music	6
EDUC 7975	Internship Seminar: Music (A capstone project is also required)	1
Total hours:		31

### Admission to Student Teaching [Screening II]

Prospective student teachers must apply for admission to student teaching during the fall semester of the fifth year. Application materials are available online at [peabody.vanderbilt.edu/admin-offices/teacher-licensure/licensure\\_for\\_undergraduate\\_students/screening.php](http://peabody.vanderbilt.edu/admin-offices/teacher-licensure/licensure_for_undergraduate_students/screening.php). Deadline for submitting applications is 1 October. Student teaching requires at least two placements at two different age levels in a fifteen-week semester.

#### General Criteria for Admission to Student Teaching

1. Completion of the B.Mus. degree.
2. Admission to the Master of Education program.
3. Successful completion of all courses prerequisite to student teaching.
4. A minimum grade point average of 3.00.
5. Satisfactory performance in course work in areas in which teacher licensure is sought.
6. Submission of a résumé and a letter to parents introducing yourself and outlining your goals for the students you teach.
7. Endorsement by the appropriate faculty regarding academic, musical, and personal readiness to teach, including dependability, professional and ethical behavior, attitude, and interpersonal skills.

#### Application for Teacher Licensure and University Recommendation for Licensure

All students completing the teacher education program at Vanderbilt are strongly advised to apply for a license in Tennessee whether or not they plan to teach in this state. Normally a Tennessee license is accepted in all other states and foreign countries in which Vanderbilt students apply to teach. The student is responsible for applying for licensure through the Office of Teacher Licensure located in 210 Peabody Administration Building. Each state has its own set of application forms and procedures for licensure; information is available in the Office of Teacher Licensure.

To be licensed through Vanderbilt's teacher education program, a graduate must earn a positive licensure recommendation from the university. The university's decision to recommend a candidate is based upon the following:

1. Maintaining a 3.0 grade point average in the fifth year.
2. Achieving the state minimum score on all required parts of the PRAXIS Examinations. A copy of the scores must be sent to the Vanderbilt Office of Teacher Licensure (code R 1871).
3. Satisfactory completion of the Teacher Performance Assessment (edTPA).
4. Receiving a positive recommendation from the student's department as a result of the student teaching experience (Pass in student teaching does not guarantee a favorable recommendation).

All Vanderbilt teacher education programs are approved by the National Council for Accreditation of Teacher Education (NCATE). The program for licensure to teach instrumental/general or vocal/general music is approved by the National Association of Schools of Music (NASM).

### 3+2 B.Mus./MBA Blair-to-Owen Program

The five-year joint program between the Blair School of Music and the Owen Graduate School of Management allows a small cohort of particularly motivated students to overlap their undergraduate coursework with work toward the MBA, facilitating the earning of both the undergraduate and graduate degrees in five years (ten semesters). By combining three and one-half years in Vanderbilt's Blair School of Music with one and one-half years of study in the Owen School, students may obtain both the bachelor of music and the master of business administration in five years. The baccalaureate from the Blair School is awarded at the end of the fourth year, and the MBA from the Owen School after the fifth year. Students interested in pursuing this program must be enrolled in the musical arts major.

This program follows the model adopted by the College of Arts and Science and the School of Engineering, in which a student spends his or her undergraduate time to "pursue intellectual curiosity and develop analytic and communication skills—without regard to subject matter," completing all of the requirements of an established undergraduate major. Thus, students in this Blair-to-Owen program will continue to fulfill all of the B.Mus. degree requirements in musical arts, but choose course offerings (particularly in their academic electives) that will facilitate a rapid completion of the MBA requirements.

Required course work includes the normal Blair course work for the musical arts major, plus Business of Music (MENT 1120) and a graded internship (MENT 3880 or 3881), for a minimum of 80 credit hours in music. The liberal arts core will also follow the requirements for the major, but must include the following specific requirements:

- Calculus (1 semester)
- Statistics, e.g., ECON 1500: Economic Statistics
- ECON 1010: Principles of Macroeconomics
- ECON 1020: Principles of Microeconomics
- ECON 3010: Intermediate Microeconomic Theory

A curriculum plan, including recommended electives, is provided in the *Blair Student Handbook*.

Students must apply to the Owen School for admission to the five-year program during their junior year. Applications are due no later than October 1 of the junior year, and early application and GMAT are recommended. Acceptance into the five-year program is extremely competitive and requires advanced standing earned in undergraduate courses. Being deficient in full-time work experience, the 3+2 student must enhance his or her portfolio with outstanding academic performance and show a strong commitment to a rigorous business education. The Summer Business Institute (Accelerator) is strongly recommended for 3+2 applicants prior to matriculating at Owen. The successful applicant will bring an accomplished academic record (normally a GPA of 3.3 or better), satisfactory internship or work experience, an ability to articulate his or her own preparedness for the work environment, and a strong endorsement from Vanderbilt faculty.

Students who are accepted to the 3+2 program will remain registered as B.Mus. students through spring of junior year and fall of senior year, and will register as Owen students in spring of senior year. Academically, students will take a full load of business courses both in fall and spring of senior year while completing the final B.Mus. degree requirements

(normally, lessons and ensembles) in the musical arts major. The completion of the B.Mus. degree requirements prior to fall of the student's fifth year is required for continuation in the MBA program.

### **Tuition and Financial Aid**

The scholarship or other financial aid commitment of the Blair School will not be continued automatically beyond the seventh semester for students enrolled in the joint program. Eighth-semester financial aid is the student's responsibility. Students should notify the Owen School with their application if they are interested in being a candidate for an Owen scholarship during their MBA studies. Early application is recommended. *Need-based aid will still apply.*

Students pay tuition to the undergraduate school for the fall semester of their fourth year, after which all tuition is paid to Owen (and reflects graduate school tuition rates). The Blair School of Music will waive fees for the required performance instruction during spring of the fourth year to facilitate completion of the B.Mus. requirements.

## Special Programs

**B**LAIR School of Music offers individual, group, class, and ensemble instruction to precollege and adult students (defined as students above high school age not receiving university credit). A catalog describing these programs is available at [blair.vanderbilt.edu](http://blair.vanderbilt.edu).

### The Adult Program

Blair offers to adults individual instruction in orchestral instruments, piano, organ, guitar, harp, saxophone, euphonium, fiddle, banjo, mandolin, dulcimer, steel drum/pan, voice, and composition. Jazz voice, guitar, drumset, saxophone, and piano are also available. Group instruction is available in guitar, percussion, and steel drum.

Classes are offered in music theory, music literature and history, music business, songwriting, and Alexander Technique. Ensembles open to adults include the Vanderbilt Community Chorus, steel drum ensemble, African Performing Ensemble (Sankofa), fiddle ensemble, and the collegiate chamber music offerings.

### The Precollege Program

Blair offers individual instruction in orchestral instruments and in piano, organ, guitar, harp, saxophone, euphonium, fiddle, banjo, mandolin, dulcimer, steel drum/pan, and voice. Jazz voice, guitar, drumset, saxophone, and piano are also available. Group instruction is available in piano, fiddle, and (for young children) Kindermusik for ages birth to six years. Instruction using the Suzuki method is offered in violin and cello.

Class instruction includes music theory, music literature/history, musicianship, and Alexander Technique.

Ensemble training is offered through the Nashville Youth Orchestra program, the Blair Children's Chorus program, Violin Performing Ensemble, Cello Choir, and chamber music.

The Blair School Certificate Program provides a curriculum integrating advanced levels of performance study with training in music theory and history, chamber music (Certificate of Distinction), performance classes, and recitals. Students who successfully complete the requirements for this program present a solo recital during their high school senior year and receive either the Certificate of Distinction or the Certificate of Merit upon graduation. Honors may be earned with additional study in music theory and history. A variety of merit and need-based scholarships, for which students may audition, are awarded each year to outstanding precollege students by the school and by several donors. Students in area high schools may earn out-of-school credit towards high school graduation for individual study of music at Blair or through participation in the Nashville Youth Orchestra program or Blair Children's Chorus program.

### The Blair Concert Series

The Blair Concert Series offers solo, chamber, and orchestral music performances to the university community and the region through the faculty Signature Series, the BMI Composer-in-Residence Series, and the Music on Film Series. National and international artists and ensembles, the Blair faculty, including resident ensembles and soloists, and student ensembles and performers are all featured. Weekly student

recitals are open to the public, as are all other student recitals. More than 300 concerts are presented at the school each year, and most are free of charge, as a gift to the community.

"The Blair Commissions: Music for the 21st Century," a project funded by the James Stephen Turner Family Charitable Foundation, presented three major world premieres by some of the world's most celebrated composers in the 2009–12 concert seasons. The first premiere, *A Year in the Catskills* by Peter Schickele, was performed in Ingram Hall on March 16, 2009, by the Blair Woodwind Quintet. In spring 2010, the Blakemore Trio premiered a work by composer/soprano Susan Botti in Nashville and at Merkin Hall in New York City. *Images from a Closed Ward*, composed by Michael Hersch for the Blair String Quartet, was premiered in Nashville and New York City in spring 2012. The project serves two intertwined missions: to promote the composition of outstanding works by the world's leading composers and to invite attention to the excellent ensembles and faculty performers of Vanderbilt University.

The BMI Composer-in-Residence program, sponsored by Broadcast Music Inc., brings visiting composers to campus every year. The three-day residency includes lectures, performances of the composer's works, and opportunities for interaction with students. Composers-in-residence have included Robert Beaser, George Crumb, Michael Daugherty, Lukas Foss, John Harbison, Karel Husa, Steven Mackey, Donald Martino, Cindy McTee, Kevin Puts, Christopher Rouse, Adam Schoenberg, Joseph Schwantner, Frank Ticheli, Michael Torke, and Joan Tower.



# Academic Regulations

## Honor System

All academic work at Vanderbilt is done under the Honor System (see the chapter on Life at Vanderbilt.)

## Faculty Advisers

All entering students are assigned academic advisers who assist in the planning of programs and course schedules. Students are required to meet with their advisers prior to registration for each semester.

## Class Attendance

Students are expected to attend all sessions of each class in which they are enrolled. Attendance is usually a factor in determining the final grade in a course. A student who fails to abide by the attendance policy set by the course instructor is subject to removal from the course.

The last day before and the first day after official holidays are considered to be the same as any other day on which classes are scheduled. Assignments are made for classes scheduled on these days, and tests may be given in them. Students should take this fact into account in making travel plans.

## Classroom Recording Policy

The use of technologies for audio and video recording of lectures and other classroom activities is allowed only with the express permission of the instructor. In cases where recordings are allowed, such content is restricted to personal use only, unless permission is expressly granted in writing by the instructor and by other classroom participants, including other students. Personal use is defined as use by an individual student for the purpose of studying or completing course assignments. When students have permission for personal use of recordings, they must still obtain written permission from the instructor to share recordings with others.

For students registered with EAD and who have been approved for audio and/or video recording of lectures and other classroom activities as a reasonable accommodation, applicable federal law requires instructors to permit those recordings. Such recordings are also limited to personal use, except with permission of the instructor and other students in the class.

## Credit Hour Definition

Credit hours are semester hours; e.g., a three-hour course carries credit of three semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements which exceed this definition. Certain courses (e.g., dissertation research, ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester will be included in the course description.

## Course Load

Tuition is charged on the basis of a normal course load of 12 to 18 semester hours. Course loads outside the norm, which must be recommended by the student's adviser and approved by the associate dean, are charged at an hourly tuition rate. Students permitted to take fewer than 12 hours are placed on probation, unless their light load is necessary because of outside employment or illness. The maximum course load for the summer session is 12 hours (6 hours for a summer half-session). A student must be enrolled in a minimum of 12 hours to be classified as a full-time student.

## Residence Requirement

A minimum of four semesters and at least 63 credit hours, as well as the last two semesters and the last 30 credit hours, must be spent in residence in the Blair School. Students transferring from other schools of the university must spend the last two semesters and at least the last 30 credit hours in residence in the Blair School. Students who wish to study abroad or study away in their penultimate semester may petition the Blair Curriculum Committee for a waiver of the residence requirement.

## Advanced Placement

*Advanced Placement with Credit.* Advanced placement with credit is granted in a number of areas (see the chapter on Admission).

*Advanced Placement without Credit.* Students may be admitted to advanced music courses on the basis of placement tests at Blair, but no credit is awarded for music courses exempted.

## Transfer Credit

*Transfer courses* are often taken as free electives, but they may also earn liberal arts core credit. They may not fulfill the music core requirements, count as part of the last 30 hours of residence, serve as repeat credit, or be taken on a Pass/Fail basis. Work transferred from another institution will not carry with it a grade point average. No course in which a grade below C- was received will be credited toward the B.Mus. degree.

*Pre-freshman work.* Credit for pre-freshman college work may be given, subject to evaluation by the Office of Academic Services and approval of the associate dean. Credit for courses taken at another institution during the summer preceding a student's initial enrollment at Vanderbilt will be granted only if approval is obtained in advance from the associate dean. The course work must be comparable to courses offered at Vanderbilt. Credit will be awarded only if the course is regularly offered by an accredited two-year or four-year college or university, if the teacher was a regular faculty member of that institution, and if a majority of the students in the course were candidates for a degree at that institution.

*Summer studies.* Students enrolled at Blair may receive transfer credit for summer courses taken at another four-year, fully accredited institution. This may include work at festivals or camps, if offered through an accredited institution. To qualify for summer credit, a student must be in good standing, consult the Office of Academic Services, provide course descriptions, and obtain authorization in advance. Deadline for pre-approval is April 1.

*Semester work at another institution.* Students wanting to receive transfer credit for a semester of work at another institution must receive approval in advance from the associate dean. To qualify for such credit, the student must be in good standing and must present a plan that makes clear the educational rationale for such work, the ways in which it supplements the Vanderbilt curriculum, and the equivalence of standards to those at Vanderbilt. Approval of the overall plan must be followed by approval of specific courses by the associate dean, the appropriate academic department, and the registrar's office.

### Transfer Students

Transfer applicants must comply with university standards (see the chapter on Admissions). The required audition is of major importance in the evaluation of any application. Composition applicants must submit a composition portfolio and interview with a member of the composition faculty.

Transfer students must submit catalog copy and, in most cases, course syllabi from the previous institution(s). A level of performance study is assigned based on the entrance audition. Credit for courses is subject to evaluation. Music courses may require an examination to verify placement and/or credit at Vanderbilt, and credit for non-music courses must be approved by the appropriate Vanderbilt department. Transfer students must complete at least half the credit required for the degree, or 63 hours, at the Blair School. See also, *Transfer courses*.

*Intra-university transfer.* Students intending to transfer within the university should meet with the head of academic advising and file appropriate paperwork. For students transferring out of the B.Mus. program, music fees are covered through the end of the final term as a B.Mus. student. All students are expected to maintain a minimum of 3 credit hours within their home school until transfer is approved. First semester freshmen are ineligible for transfer status. See also, the chapter on Admissions.

### Study Abroad

Five Vanderbilt study abroad programs are coordinated with the degree programs in music: the IES programs in Vienna, Austria, and in Amsterdam, The Netherlands, the Milhaud Conservatory through Vanderbilt in France, the DIS program at the Royal Danish Academy of Music in Copenhagen, Denmark, and the IFSA/Butler program at the University of Sydney and Sydney Conservatorium of Music in Sydney, Australia. These programs include provisions for lesson and ensemble credits, contingent upon audition and admission to the program. These will count towards the Blair music core and are covered at least in part by regular tuition and fees, although students are responsible for any instrument rental fees they accrue. All programs also allow for a range of liberal arts and elective credits. Students enrolled in IES Vienna will be required to enroll in German; there is, however, no language prerequisite for admission to the program. Further information can be obtained from the Vanderbilt Global Education Office and from Blair's associate dean.

Blair students may also elect any of the Vanderbilt-approved study abroad programs; see descriptions under "Study Abroad" in the front chapters of the catalog. Blair students in these programs have typically enrolled in music electives, courses in the liberal arts core, and course work toward minors and second majors. Students in these programs typically arrange alternative private lesson study, and those fees are usually not covered by tuition. It is also possible to pursue study abroad through

transfer credit; the associate dean's office has more details. It should be noted, however, that if a program has been approved for direct credit by Vanderbilt, it must be taken as the approved direct-credit program by matriculated Vanderbilt students. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved direct-credit program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt. Any student studying abroad must register for International SOS.

### Registration

Registration is available to entering first-year students in June. Continuing students register on dates specified each semester in the University Calendar and as assigned in "YES" (Your Enrollment Services, [yes.vanderbilt.edu](http://yes.vanderbilt.edu)). Conferences with faculty advisers are required before students may register. Detailed information on registration is available on the University Registrar website, [registrar.vanderbilt.edu/registration/registration-information/](http://registrar.vanderbilt.edu/registration/registration-information/).

Prior to registration, students should refer to the sample curriculum plans in the *Blair Student Handbook*. Records and the degree audit should be checked regarding progress toward completing the following:

1. Music core
2. Liberal arts core
3. Additional major area requirements

A student whose registration choices are denied or altered (full or cancelled class, lack of prerequisite courses, etc.) may select alternate courses during the Open Enrollment registration period.

### Change of Course

Course changes may be made during the Open Enrollment period or the official Change Period (Drop/Add) as published in the University Calendar. All changes need the adviser's approval. A course dropped during the Change Period does not show on a transcript.

A course may be dropped or changed from P/F to graded status prior to the deadline for withdrawal published in the University Calendar. The approval of the adviser and associate dean is required (see Grading System regarding withdrawal grades). Regularly enrolled students must maintain a minimum course load of 12 hours.

### Grading System

A:	excellent
B:	good
C:	satisfactory
D:	minimum pass work
F:	failure

Under certain circumstances the following grades may be awarded (see explanations below):

Pass:	D- or above
W:	withdrawal
M:	missed final examination (prior approval needed; see below)
I:	incomplete in some requirement other than final examination (see below)
MI:	missed final examination and incomplete in some other requirement

Plus and minus modifiers may be associated with letter grades A through D as shown in the table below. Grade point averages are calculated using indicated grade point values.

### Defined Grades with Corresponding Grade Points Per Credit Hour

A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
C+	= 2.3	F	= 0.0

### Grade Point Average

A student's grade point average is obtained by dividing the total grade points earned by the number of hours for which the student registered, excluding courses audited or taken for no credit, those from which the student has withdrawn or for which an incomplete grade (*I*, *M*, or *MI*) has been authorized, and those with the grade *Pass*.

### Pass/Fail Option (Elective)

Students may elect to take a limited number of courses on a Pass/Fail (P/F) basis. To enroll for a course on a Pass/Fail basis, students must have completed at least two semesters at Vanderbilt, must have achieved at least sophomore standing, and must not be on academic probation. The Blair Office of Academic Services can assist with P/F registration.

For B.Mus. students, the Pass/Fail option is limited to courses taken as free electives. Course work in the area of a minor or second major is governed by the school in which the department or program is housed. No more than one course may be elected on a Pass/Fail basis in any one semester. Only a total of 18 hours towards the 126-hour degree total may be taken on a Pass/Fail basis. Students electing course work on a Pass/Fail basis must be enrolled for 12 graded hours. A graduating senior who has permission to take fewer than 12 hours on a graded basis may take one course on a P/F basis in addition to the courses required for graduation. If the student does not graduate at the end of that semester, the grade *P* is automatically converted to the grade actually earned.

Students may register for grading on a Pass/Fail basis until the close of the Change Period. Students may change from Pass/Fail to graded status until the deadline date for dropping a course that is published in the University Calendar.

Those electing the Pass/Fail option must meet all course requirements (e.g., reports, papers, examinations, attendance, etc.) and are graded in the normal way. Instructors are not informed of the names of students enrolled on a Pass/Fail basis. At the end of the semester, a regular grade is submitted for the student enrolled under the P/F option. Any grade of *D-* or above is converted in the Student Records System to a *P*, while an *F* will be recorded if a student enrolled under this option fails the course. The *P* grade is not counted in the grade point average nor used in the determination of honors. The grade of *F* earned under the Pass/Fail option is included in the calculation of the grade point average.

### Deficiency Notices

During the week after mid-semester, the University Registrar posts deficiency notices for students whose mid-semester grade in any course is a *C-* or below or whose work is incomplete (*I*). (Deficiency notices are found in the Access to Academic Information application in YES at [yes.vanderbilt.edu](http://yes.vanderbilt.edu).) Deficiencies are issued as a matter of information and warning. Deficiencies do not show on transcripts, but information is sent to the faculty

advisers and may be sent to parents of those students who are dependents of their parents or who have authorized such reports.

A student who receives a deficiency notice is required to meet with the faculty adviser before the deadline for withdrawal at the end of the week. A student with deficiencies in two or more courses or any senior who receives a deficiency notice is also required to meet with the associate dean before the deadline for withdrawal (usually Friday of the week after mid-semester).

### W: Withdrawal

A student may withdraw from a course after the official Change Period and prior to the deadline for withdrawal published in the University Calendar, generally Friday of the week after mid-semester. A course enrollment form must be signed by the instructor, adviser, and associate dean and filed with the registrar. (Students from other schools of the university must file with their home school.) Withdrawals after the published deadline result in an *F*. The grade *W* may be assigned by the associate dean to a student who seeks to withdraw from a course or from school after the deadline for reasons such as extended illness or unusual personal or family problems. No *W* grades are calculated in a student's grade point average.

### Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. A student who receives a temporary grade is ineligible for the Dean's List. Students cannot graduate with any temporary grades.

### I: Incomplete

An Incomplete is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The *I* is not intended as a replacement for a failing grade, nor should it be given to a student who misses the final examination. The *M* grade is used for the latter purpose. The request for an Incomplete is generally initiated by the student and must be approved by the instructor. The instructor may initiate the assignment of an Incomplete if warranted by the circumstances and conditions referenced above. In either case, in assigning the grade of *I*, the instructor specifies (a) a default grade that counts the missing work as zero and (b) a deadline by which the missing work must be submitted. That deadline must be no later than the last class day of the next regular semester in residence. The Incomplete can be extended beyond the next semester only if the student's associate dean determines that an extension is warranted. If the required work is submitted by the deadline for removing the Incomplete, the *I* will be replaced by the grade earned. If the work is not completed by the deadline, the default grade will become the permanent grade for the course.

The Incomplete is not calculated in the GPA, but a student who receives an Incomplete is ineligible for the Dean's List.

### M: Missing a Final Examination

The grade *M* is given to a student who misses the final examination and is not known to have defaulted, provided the student could have passed the course had the final examination been successfully completed. The grade of *F* is given if the student could not pass the course even with the final examination.

It is the student's responsibility to contact the Dean's Office before the first class day of the next regular semester, regardless of whether the student will be in residence that semester, to request permission to take a makeup examination. The makeup examination must be taken on or before the tenth class day of the next regular semester. If the request has not been submitted by the proper time, or if the student fails to take the makeup examination within the prescribed time, the *M* grade will be replaced by a default grade submitted by the instructor when the *M* is assigned.

### *MI: Missing a Final Examination and Other Work*

The grade *MI* is assigned to a student who misses the final examination and whose work is incomplete in other respects. The *MI* may not be turned in without prior authorization by the associate dean. It is the student's responsibility to contact the Dean's Office to request permission to take a makeup examination and to arrange for submission of the missing work.

### **No-Credit Courses (NC)**

Students who wish to take courses on a no-credit basis must file with the Blair Office of Academic Services before the end of the Change Period. Students must attend class and complete all course work. A grade is recorded on the transcript with the notation *NC*, indicating that it does not count toward the degree.

No-credit courses count in the computation of a student's academic load and tuition, but not in the computation of the grade point average.

### **Auditing**

Regularly enrolled Blair students who want to audit courses in any of the undergraduate schools of the university must obtain the written consent of the instructor to attend the class but do not register for the course for credit. Forms are available from the Blair Office of Academic Services. No permanent record is kept of the audit. Regular students may audit one class each semester.

### **Repeated Courses**

Certain courses, notably performing ensembles and variable credit performance instruction, may be taken more than once for credit. Otherwise, students may repeat any course to replace a grade, with no additional credit hours earned, subject to the following conditions:

Courses taken at Vanderbilt may not be repeated elsewhere.

A grade may not be replaced by a grade of "Pass."

A grade of *W* or *I* cannot replace a letter grade.

Only the most recent grade is calculated in the grade point average, but all grades show on the transcript.

### **Dead Week**

The last week of classes, i.e., the last seven calendar days before the final examination period each semester, is designated as dead week. No examinations of any type, including quizzes, portions of final examinations, recitals, or ensemble performances, may be given during this time without the express written permission of the dean and notification of students at least two weeks before dead week. Violations should be reported to the dean.

### **Examinations**

All examinations are conducted under the honor system. Primary and alternate exam schedules, which allow two hours for a final exam in each course, are listed on the University Registrar's website. The instructor may use the alternate schedule in addition to, but not instead of, the primary schedule.

Alternatives to standard in-class final examinations, such as term papers or take-home, self-scheduled, or oral examinations may be given at the instructor's discretion. A take-home exam is distributed at the last regular class meeting and must be completed by the latest time scheduled for the final examination.

Performance examinations are scheduled by department chairs. Students giving full recitals during the semester may be exempted from performance examinations at the discretion of the instructor. If performance examinations are scheduled on a reading day (the day after classes end, when no course examinations are scheduled), students are also given the choice of a different day for their performance examinations.

A student who misses a final examination may be eligible to receive the grade *M* (see Temporary Grades).

### **Writing Portfolio**

Students in their senior year are required to submit a writing portfolio drawn from academic course work from one or more classes to be evaluated by a faculty committee. Emphasis should be placed on demonstrating an ability to write clearly and effectively and on the student's ability to form connections across two or more disciplines. Students are required to prepare a one-paragraph narrative explaining how the submitted work demonstrates the required competencies.

### **Grade Reports**

Grade reports and faculty critiques of performance examinations will be provided to students as soon as possible at the end of each semester. Grades are available online in the Academic Record, which is housed within YES (Your Enrollment Services) at [yes.vanderbilt.edu](http://yes.vanderbilt.edu). Occasionally, student academic information may be shared with appropriate faculty committees for purposes of promotion and tenure review.

A grade reported and recorded in the Office of the University Registrar may be changed only upon written request of the instructor, on certification that the original report was in error, with approval of the associate dean.

### **Academic Standards**

For the purposes of class standing, a regular semester is defined as any fall or spring term in which a student is registered for at least 12 hours.

#### *Class Standing*

To qualify for sophomore standing, a student must complete a minimum of 24 hours with a grade point average of 1.8 and have completed two regular semesters.

To qualify for junior standing, a student must complete a minimum of 54 hours with a grade point average of 1.9, must complete MUTH 2200 and MUSC 2200, and must have completed four regular semesters.

To qualify for senior standing, a student must complete a minimum of 86 hours with a grade point average of 2.0 and have completed six regular semesters.

### *Academic Probation*

Students are placed on probation if they fail to meet class standing benchmarks, as noted above. Students on probation must qualify for class standing in one additional semester or risk being dropped from the university.

Students are placed on academic probation: if they fail to meet class standing benchmarks; if they complete fewer than 12 hours in a fall or spring semester except in cases involving documented mitigating circumstances (illness, injury, or family emergency); or if their semester grade point averages fall below 1.8 overall or 2.0 in music. In addition, freshmen are placed on academic probation if they do not complete one writing course. Incomplete grades may adversely affect class standing or grade point averages.

Students on academic probation may not transfer summer study credit, elect to take courses on a Pass/Fail basis, earn credit by departmental examination, or participate in any extracurricular performance activity. They are required to participate in a special academic advising program. Students will be placed on probation no more than twice. Students who are candidates for probation a third time will be dropped from the university.

### *Sudden Academic Insufficiency*

Any student who fails by a wide margin to reach prescribed levels of academic achievement, either at the end of a semester or at mid-semester, is reviewed by the associate dean's office in conjunction with the academic and studio adviser(s). If the student is not making satisfactory progress towards the degree, the student may be placed on probation or may be advised or required to take a leave of absence or advised to withdraw from the university. Appeals of such findings should be addressed to the Blair Curriculum Committee.

### *Scholarship Student Requirements*

Students receiving honor scholarships through Blair School of Music must be enrolled full time, taking all assigned music courses, must qualify for class standing, and must maintain each semester minimum grade point averages of 2.0 overall and 2.7 in music. Students receiving the Cornelius Vanderbilt Honor Scholarship must maintain a minimum 3.0 grade point average overall and 3.0 in music each year. Additional requirements may be stipulated in scholarship award letters.

Honor scholarship awards are considered for renewal annually. Student work will be reviewed at the end of spring semester for possible renewal for the following academic year. Incomplete grades may adversely affect renewal. A student who falls short of the requirements will normally have the scholarship for one semester of grace, after which, if requirements are still not met, the scholarship will be lost.

Students receiving scholarships or grants as part of their financial aid packages (not honor scholarships) must qualify for class standing in order to be considered for renewal each year. Students receiving federal aid are expected to make satisfactory academic progress as outlined in the chapter on Financial Information.

### **Graduation Requirements**

Candidates for degrees must have completed 126 hours and all curriculum requirements, have passed all prescribed examinations, and be free of indebtedness to the university.

Exceptions to stated degree requirements and procedures must be approved by the Curriculum Committee as the representative body of the faculty in matters pertaining to the curriculum.

The minimum grade point averages required for graduation are 2.0 overall and 2.0 in music. A student taking a second major must earn a 2.0 in that major in order for it to be certified on the transcript.

If requirements for graduation change, students may elect to be bound by requirements published in the *Undergraduate Catalog* in either their entering or their graduating year.

### **Degree Audit Reports**

An online degree audit is available on YES to all Blair students, showing total hours earned, degree requirements completed, and those still to be met. Students should examine the audit carefully with their faculty advisers. Problems or suspected errors should be discussed immediately with the Blair Office of Academic Services.

### **Credit by Departmental Examination**

In certain circumstances, students may be awarded course credit (a maximum of 8 hours) by departmental examination. This procedure is distinct from the awarding of credit through the College Board Advanced Placement Tests or the International Baccalaureate. Students apply for credit by examination through the Blair Office of Academic Services.

To earn credit by departmental examination, students must be enrolled for at least 12 hours, be in good standing, be recommended by their advisers, and have the approval of the appropriate department. In addition, students must seek prior approval of their study plan through the associate dean's office. Students may attempt to earn credit by examination in no more than two courses in one semester, only once in any course in one semester, and no more than twice in the same course.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 hours are not charged extra tuition for hours earned through credit by examination, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses and courses dropped after the change period. Students in this category must pay a \$50 fee for the cost of constructing, administering, and grading the examination. Since this cost has already been incurred, students who refuse the credit hours and grade are charged the \$50 fee nevertheless. Full-time students with a tuition load exceeding 18 hours and students taking fewer than 12 hours pay tuition at the regular rate, per credit hour, with no additional fee.

### **Senior Re-examination**

A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed would prevent the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from re-examination. The re-examination must be requested through the student's associate dean's office, and, if approved, it is given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination

will receive a *D-* in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course. **Note:** For engineering students taking engineering courses, the senior re-examination policy applies if a student fails not more than one course in the senior year.

### Independent Study

Students must obtain permission to enroll in Independent Study from the instructor of their choice prior to registration. Independent Study authorization forms are available at [blair.vanderbilt.edu/academics](http://blair.vanderbilt.edu/academics). The instructor's signature on the authorization form indicates a willingness to supervise the Independent Study project. A contract or study plan, approved by the instructor in consultation with the appropriate department chair and the associate dean, must be submitted to the Blair Office of Academic Services by the tenth calendar day after classes begin. If no plan is submitted, the student will be dropped from Independent Study. An Independent Study project should result in a substantial written report, paper, or lecture/recital. The report, recording, or some physical manifestation of the project should be retained by the instructor. Independent Study projects proposed by students for cross-school registration must be approved through the mechanisms of both schools. Consult associate deans from both schools for guidance.

A student may register for a maximum of 3 hours in Independent Study in a semester. A student may count a total of 6 hours in Independent Study toward the degree. A faculty member may supervise no more than four students per semester in Independent Study projects.

Independent Study cannot substitute for courses which are part of the curriculum.

### Internships

The Career Center assists students interested in internship opportunities in the music industry and elsewhere; there are opportunities in many states of the U.S. and also abroad, both during the academic year and in the summer. A student serving as an intern may register for MENT 3880, 3881, or 3882 as a corollary if credit is desired. Students with summer internships that require an academic component must register for credit. A maximum of 6 hours of internship credit may be counted toward the degree. Students are responsible for finding a faculty sponsor; a written study plan must be approved by the faculty sponsor and the Blair associate dean no later than the tenth day of classes. Internship paperwork is available on the Blair School website at [blair.vanderbilt.edu/academics](http://blair.vanderbilt.edu/academics).

### Performance Instruction: B.Mus. Degree

*Fees.* Performance instruction fees are waived for B.Mus. students.

*Elective credit.* B.Mus. students taking a second instrument normally enroll in 1100-level performance instruction for 1 or 2 hours elective credit. Consent of the instructor is required. B.Mus. majors who have declared a minor instrument also register for performance instruction at the 1100 level; consent of the instructor and notification of the Blair Office of Academic Services are required.

*Composition Majors.* Students register for performance instruction at the 1100 level. A minimum of 6 semesters of study totaling 6 credit hours is required.

*Musical Arts Majors and Musical Arts/Teacher Education Majors.* First-year students and sophomores register

for 2100-level performance instruction in their primary area. Juniors and seniors register for 4100-level performance instruction in their primary area. A minimum of 8 semesters totaling 16 credit hours required; performance instruction required every semester in residence.

*Performance Majors.* First-year students and sophomores register for 2200-level performance instruction in their primary area. Juniors and seniors register for 4200-level instruction in their primary area. A minimum of 8 semesters totaling 32 hours (instrumental performance majors) or 28 hours (vocal performance majors) required; performance instruction required every semester in residence.

### Upper Divisional Hearing (Performance Majors Only)

Requirements for performance majors include an upper divisional hearing in the sophomore year to determine continuance in the performance degree program and permit subsequent enrollment in upper division study at the 4200 level. Students are required to perform a program of twenty to thirty minutes for a faculty committee convened by the studio instructor or by the department chair. The committee will normally consist of the student's studio teacher and at least two additional members of the department. Memorization is required as appropriate, and accompaniment is expected where called for.

The student must consult with the studio instructor regarding appropriate repertoire. Instrumental selections must be chosen from the solo repertoire and should represent diverse historical periods. Percussionists must perform on keyboard percussion, timpani, and snare drum and/or multiple percussion. String repertoire must include solo Bach. Pianists must perform a 30-minute memorized program of solo piano literature representing at least three style periods. Vocal repertoire must include a minimum of five songs of contrasting periods and styles, using three languages (Italian, English, and either French or German).

Failure to pass this hearing demonstrates a lack of the requisite skills to graduate in performance at Blair, necessitating transfer to another degree program. A student may petition the faculty once for a second hearing, with entirely different repertoire, to take place before the end of the first semester of the junior year.

### Solo Recitals

#### Pre-Recital Hearing

All students (excepting composition) giving required recitals and any student who wishes to give a recital in the Blair building must pass a hearing, held at least three weeks before the recital. After establishing a recital date, the student, with guidance from the studio instructor, will assemble a recital hearing committee, consisting of two additional faculty members, one of whom must be from outside the student's performing area. For musical arts/teacher education students, the committee will normally consist of the studio instructor, a teacher education faculty member, and at least one additional faculty member. For non-required, non-credit recitals, the hearing committee may be from within the department. For any recital involving a student's second performing medium, the student must seek approval from the studio instructor and department chair of the secondary and primary performing areas; in addition, a full-time faculty member from the secondary performing area must be part of the hearing committee. The student must notify the recital hearing committee, in writing, of the hearing date, recital

date, time, and place. Senior composition recitals are screened in advance at the department level.

For a required junior or senior recital, the repertoire will normally encompass three major style periods, as appropriate to the medium; normally, at least one work in a contemporary idiom will be included in either the junior or senior recital. The hearing committee should hear all of the recital repertoire. Grading of the hearing is on a Pass/Fail basis, with written faculty comments. If a student fails the hearing, another must be scheduled. Only two recital hearings in one semester are permitted.

### *Recital and Recital Committee*

For recitals given for credit, the recital committee is the same as the hearing committee whenever possible. The final grade is a composite of those of the committee members, with the studio instructor's grade valued at 50 percent. Copies of committee member's grades are kept by the instructor. Recitals not given for credit are not graded; they involve a hearing committee but not a recital committee.

### **Extracurricular Performance**

Students must be in good standing and have the consent of their private instructors in order to participate in any extracurricular performance activities, including in-school collaboration, that are not required by a student's degree program or honor scholarship.

### **Recital Attendance**

Each semester in residence, students (except graduating seniors in their penultimate or final semester) are required to register for and attend weekly student recitals/convocations on Fridays at 12:10 p.m. and a minimum of six Blair faculty or professional concerts or their community equivalents as described on the syllabus. Students must fulfill both aspects of the requirement to pass each semester. The course receives zero credit hours but is graded on a Pass/Fail basis and listed on students' transcripts. Incompletes will not be granted except in the case of documented medical emergency.

Students must register their attendance at each recital. Two absences from Friday afternoon recitals are permitted each semester. Under extraordinary circumstances, make-up assignments can be obtained from the recital attendance coordinator with the permission of the associate dean. Students must plan and keep up with their concert attendance. Except for weekly student recitals, performances in which students are participants do not fulfill the attendance requirement for the performer. Deadline for completion of all work is listed on the course syllabus for MUSO 1000. The first failure would result in the loss of the senior penultimate or final semester exemption. Additional failure(s) would require students to enroll for additional semester(s) until the seven required semesters are passed.

### **Change of Address**

Any change of address should be reported to the Blair Office of Academic Services and also be submitted to the University Registrar at *yes.vanderbilt.edu*. The university will consider notices or other information delivered if mailed to the address currently on file.

### **Leave of Absence**

A student in good standing may, with the approval of the associate dean, take leave of absence for one or two semesters. Application forms, available from the Blair Office of Academic Services, must be submitted by 1 December for spring semester leave or by 1 May for fall semester.

Students planning to study elsewhere while on leave (elective courses) must have prior approval if credits are to be transferable. Upon the student's return, a performance examination during the first two weeks of the semester may be needed to determine the student's standing in the major performance area.

Registration notifications are emailed to students on leave. A student failing to register at the conclusion of the stated leave will be withdrawn from the university and must apply for readmission.

Students who have been on leave of absence and not enrolled for three or more semesters or who leave the university while on academic probation must re-audition and achieve the approval of the associate dean prior to readmission.

### **Withdrawal from the University**

Students proposing to withdraw from the university during any semester must report to the Blair associate dean to initiate proper clearance procedures. Students are graded on the same basis as if withdrawing from a course. Students who withdraw before the end of the eighth week of classes receive a partial refund of tuition (see the chapter on Financial Information). Students intending to withdraw from the university for the following semester should notify the Blair Office of Academic Services by 1 December for spring semester or by 1 May for the fall semester.

Students who have withdrawn from the university without filing a Leave of Absence form must apply for readmission if they wish to return.

# Honors

## Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the Dean after consideration of faculty recommendations as well as grade point averages of the year's highest ranking graduates.

## Academic Honors Designation

Honors, which are noted on diplomas and published in the *Commencement Program*, are earned as follows:

*Summa Cum Laude.* Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's Vanderbilt graduating seniors.

*Magna Cum Laude.* Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's Vanderbilt graduating seniors.

*Cum Laude.* Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's Vanderbilt graduating seniors.

## Honors Program in Music Literature and History

The honors program in music literature and history is designed to afford superior students the opportunity to pursue more intensive work within the field of musicology or ethnomusicology, culminating in the preparation of a senior honors thesis. The course of study includes seminar work as well as independent study and writing under the supervision of a thesis adviser. Students who want to do honors work should contact the chair of the musicology department in the fall of their junior year. Departmental approval of a formal honors thesis prospectus must take place prior to registration for MUSL 4998 in spring of the junior year or fall of the senior year. Minimum requirements are a 3.0 GPA overall and 3.3 in music literature and history courses.

Students accepted into the program must take a total of 9 credit hours: MUSL 4998–4999, Senior Honors Thesis (6 hours), and one course (beyond the MUSL core) chosen from MUSL 3150, 3220–3240, 3160, 2610, or 3890 (3 hours). In addition, successful completion of the honors program requires an oral defense of the honors thesis before a faculty committee. This defense will occur at the end of the second semester of thesis enrollment. Those enrolled in the program who successfully complete its requirements with distinction may graduate with Honors or Highest Honors in music literature and history.

## Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded hours, with no temporary or missing grades in any course (credit or non-credit), and no grade of F.

## Pi Kappa Lambda

Election to Pi Kappa Lambda National Music Honor Society signifies superior accomplishment in the field of music. Students elected to membership must be outstanding musically and scholastically and ranked in the highest 20 percent of the senior class or the highest 10 percent of the junior class. The Eta Iota chapter was installed at Vanderbilt on April 8, 1992. Professor Karen Ann Krieger serves as its president.

## Awards and Prizes

Several awards are presented to students at the Blair School of Music. Announcement is made at the final student recital/convocation of the spring semester. Each carries a monetary stipend. Awards, which are published in the *Commencement Program*, are as follows:

THE MARGARET BRANSCOMB PRIZE is given annually to a Blair freshman judged by the faculty to have the musical and personal qualities that best exemplify the spirit and standards of the school. The prize was established by family and friends in memory of Margaret Branscomb, wife of the late Vanderbilt Chancellor Emeritus Harvie Branscomb.

THE SUE BREWER AWARD was established by the Songwriters Guild Foundation in memory of Sue Brewer, who befriended many of Nashville's struggling songwriters in the late 1960s and 1970s. It is awarded for excellence to a student pursuing a degree in guitar or composition.

THE RICHARD C. COOPER AWARD was established in 2002 by the Pi Delta Chapter of Phi Mu Alpha Sinfonia, to remember the outstanding contributions made by Chris Cooper to the student experience of music at Vanderbilt. Nominations are made by student organizations, recognizing campus-wide leadership in music.

THE ROBIN DICKERSON AWARD was established in 1995 in honor of soprano Robin Nell Dickerson, B.Mus. '94, by Blair faculty and students. It is awarded by the voice faculty to an outstanding voice major for excellence in performance and scholarship.

THE JEAN AND ALEXANDER HEARD AWARD. Awarded to outstanding students studying at summer music festivals.

THE JEAN KELLER HEARD PRIZE is designed for a string student seeking the Bachelor of Music degree. The scholarship fund was established by the Vanderbilt Women's Club to honor violinist Jean Keller Heard, wife of Vanderbilt's fifth Chancellor, Alexander Heard.

THE MAGDA LACHS AWARD was established in 2008 by Brenda Higgins, her family, and others to commemorate the 100th birthday of Magda Lachs, who was a passionate opera enthusiast and the mother of Vanderbilt philosophy professor John Lachs. After her death in June of 2011, several others made generous gifts in her memory. The award is given to an outstanding voice or orchestra student who participated in the current year's Vanderbilt Opera Theatre production.

THE S. S. AND I. M. F. MARSDEN AWARD IN MUSICAL SCHOLARSHIP is awarded annually to a Blair student for excellence in scholarship, e.g., a major written paper, on a topic that lies outside the normal core of scholarship. Honors projects, independent study projects, and substantial class papers are eligible for consideration for the award. Only papers of extraordinary scope, additional outside recognition, or unusual range beyond the normal core of scholarship are eligible for the Marsden Award.



THE DELENE LAUBENHEIM MCCLURE MEMORIAL PRIZE is given to a voice major who exhibits excellence in opera performance. This prize was established by alumni and faculty of the Blair School of Music and other friends of Delene Laubenheim McClure, B.Mus. '91, whose untimely death foreshortened a promising career in music. Through her participation in Blair's first opera productions, Dede helped set a standard for excellence in performance.

THE MICHELSON COLLABORATIVE ARTS AWARD is presented to a singer, pianist, or voice/piano duo for exceptional performance in vocal collaborative arts.

THE ACHIEVEMENT IN TEACHING RECOGNITION AWARD is presented by the piano faculty to a senior pianist who has demonstrated superior abilities in both private and group teaching. The recipient must intend to teach music professionally in an independent studio, in a classroom, or at the collegiate level. The prize is a one-year membership to the Tennessee and Nashville Area Music Teachers Association or the equivalent.

THE ELLIOT AND AILSA NEWMAN PRIZE is presented annually to a promising clarinetist or woodwind student for excellence in performance. The prize was endowed by Ailsa Mackay Newman in memory of her husband, Vanderbilt's Werthan Professor of Experimental Medicine, 1952-1973, and an avid amateur clarinetist.

THE L. HOWARD "ZEKE" NICAR AWARD is presented annually to the most outstanding woodwind or brass student. The award was established by family, faculty, and friends to honor the memory of the Blair School's first Assistant Dean for Admissions.

THE EXCELLENCE IN PERCUSSION PERFORMANCE AWARD was established in memory of James Harrison Griggs, an outstanding percussion major, B.Mus. '94. This award is given to a percussion major for excellence in performance.

THE PRESSER AWARD is presented to a junior for musical and academic excellence and is the most prestigious honor available to a junior at Blair. At least one third of the student's credits must be outside the field of music. The recipient must have a cumulative grade point average of 3.25 and have been named to the most recent Dean's List. The award honors the memory of Theodore Presser, American publisher and musical philanthropist.

THE DAVID RABIN PRIZE was established by family and friends in memory of Dr. David Rabin, professor of medicine and of obstetrics and gynecology at Vanderbilt University Medical School, 1975 to 1984. The prize is awarded annually, based on excellence in musical performance, to a student enrolled at Blair. The fund continues to grow as contributions in honor of Dr. Rabin are given to the school.

THE SIGMA ALPHA IOTA COLLEGE HONOR AWARD is given annually to the most outstanding member of the chapter based on scholarship, musicianship, participation in school activities, and contribution to the fraternity chapter. The award was established in 2000.

THE SIGMA ALPHA IOTA SCHOLARSHIP AWARD is given to the graduating senior who has attained the highest scholastic average during her college years. The award was established in 2000.

THE CHRISTIAN TEAL AWARD recognizes a current string student who embodies the collaborative spirit of Professor Christian Teal, who retired as Joseph Joachim Professor of Violin after forty-two years at the Blair School.

THE BLAIR VOLUNTEER SERVICE THROUGH MUSIC AWARD was newly instituted in 2009 by an anonymous donor and recognizes an outstanding student who has used music in service to others, particularly at W. O. Smith Community Music School.

THE MARTIN WILLIAMS AWARD was established in memory of Martin Williams, former director of the Smithsonian Institution's Jazz Program and Adjunct Professor of Jazz History at Blair. It is presented to the student writing the most outstanding class paper during the academic year. The fund continues to grow as gifts honoring Mr. Williams are given to the school.

# Blair School of Music Courses

Courses are listed in alphabetical order by prefix:

COMP: Composition  
 MCON: Conducting  
 MENT: Arts Advocacy, Career Development, and Entrepreneurship  
 MPED: Pedagogy  
 MREP: Orchestral Repertoire and Instrument Literature  
 MUED: Teacher Education  
 MUKH: Keyboard Harmony  
 MUSC: Musicianship  
 MUSE: Ensembles  
 MUSL: Music Literature and History  
 MUSO: Other Music Courses  
 MUTH: Music Theory  
 MWEL: Musicians' Wellness  
 Performance Instruction: Group and Individual (by instrument)  
 Performance Classes (by instrument)

## COMP: Composition

**COMP 1000. Composition Studio Class.** [Formerly MUSO 111C] Weekly observation and participation. Required of all composition majors, including musical arts. Offered on a pass/fail basis. [0] Slayton, Link, Kurek, Michael Rose.

**COMP 1100. Introduction to Composition.** [Formerly MUSC 230] An introduction to compositional techniques including a study of composers and their work. Principles of scoring, the study of notation including experimental types. Prerequisite: MUTH 1200, MUTH 1210, or MUTH 2100; or a corequisite of COMP 1150. FALL. [3] Kurek.

**COMP 1150. First-Year Composition I.** [Formerly MUSC 141] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Corequisite: COMP 1100. [1] Kurek, Link, Michael Rose, Slayton.

**COMP 2100. Composition (Elective).** [Formerly MUSC 230E] Individual instruction and seminars. A variety of media, styles, and forms. Electronic and experimental techniques. Prerequisite: COMP 1100 and consent of instructor. [Variable credit: 1-3 each semester] Kurek, Link, Michael Rose, Slayton.

**COMP 2200. First-Year Composition II.** [Formerly MUSC 142] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Prerequisite: COMP 1150. [2] Kurek, Link, Michael Rose, Slayton.

**COMP 2300. Composition I.** [Formerly MUSC 143] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Prerequisite: COMP 2200. [3] Kurek, Link, Michael Rose, Slayton.

**COMP 2400. Composition II.** [Formerly MUSC 144] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Prerequisite: COMP 2300. [3] Kurek, Link, Michael Rose, Slayton.

**COMP 3978. Junior Thesis.** [Formerly MUSC 228] Completion of an extended paper based upon musical analysis. Open only to composition/theory majors. Topic subject to approval. Progress monitored via tutorials. Completion of Junior Thesis is a prerequisite for COMP 4970 and COMP 4302. [1] Kurek, Link, Michael Rose, Slayton.

**COMP 4300. Advanced Composition I.** [Formerly MUSC 241A] Continuation of 2300-2400. Open only to composition majors. A fourth

credit hour may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

**COMP 4301. Advanced Composition II.** [Formerly MUSC 241B] Continuation of 2300-2400. Open only to composition/theory majors. A 4th credit may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: 4300. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

**COMP 4302. Advanced Composition III.** [Formerly MUSC 241C] Continuation of 2300-2400. Open only to composition/theory majors. A 4th credit may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: 4301. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

**COMP 4303. Advanced Composition IV.** [Formerly MUSC 241D] Continuation of 2300-2400. Open only to composition majors. A 4th credit may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: 4302. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

**COMP 4970. Senior Composition Recital.** [Formerly MUSC 299] Planning, rehearsing, and performing in a concert devoted solely to a student's own work. Open only to composition majors. Corequisite: COMP 4303. [1] Kurek, Link, Michael Rose, Slayton.

## MCON: Conducting

**MCON 3000. Conducting.** [Formerly MUSO 261] An introductory course of study stressing the fundamentals of movement and gesture as they relate to style, articulation, phrasing, tempo, cueing, etc. Score reading at the piano. Prerequisite: MUSC 2200, MUKH 1134 or 2134, and MUTH 2400. FALL, SPRING. [2] Fountain, P. Schneller, Verrier.

**MCON 3010. Instrumental Conducting.** [Formerly MUSO 262] Expansion of basic skills to include longer and more complex musical structures; expanded ability in analysis, memorization, and interpretation; significant independent preparation. Prerequisite: MCON 3000 and consent of instructor. [2] SPRING. Fountain.

**MCON 3020. Choral Conducting.** [Formerly MUSO 263] Choral conducting and rehearsal techniques, score reading and analysis, methods, and materials of choral music. Prerequisite: MCON 3000 and consent of instructor. SPRING. [2] Biddlecombe. (Offered alternate years)

## MENT: Arts Advocacy, Career Development, and Entrepreneurship

**MENT 1120. The Business of Music.** [Formerly MUSO 100] A general survey of music in the world of commerce. Systems of the contemporary music business, with special emphasis on the recording industry. Music business professionals as guest lecturers. FALL, SPRING. [3] Porter.

**MENT 1130. Building Communities through Music and the Arts.** [Formerly MUSO 106] The philosophical and strategic background for and practical skills in audience-focused and audience-engaged arts programming. Techniques to make music both accessible and relevant to learners; development of interactive programs and curriculum-directed programs; form, structure, and pacing of programs, including repertoire selection and duration, presentation of music, and participatory experiences. FALL [1] Korn.

**MENT 1135. Arts Administration: Best Practices and Careers in the Arts Organization Marketplace.** A study of best practices and development of marketable skills in arts administration. Investigation of arts

administration employment opportunities, roles and responsibilities in executive leadership, finances, fundraising, artistic leadership, education, organizational development, and marketing and media. Leading arts institutions are studied as models for arts administration careers and professional advancement. Guest artist administrators will further class discussion and real world application. SPRING [1] Korn.

**MENT 1140. Creating Funding and Non-Profit Vehicles for 21st Century Community Service.** [Formerly MUSO 107] Strategies for planning, financing, supporting, and sustaining an artistic and social development mission. Specific tools for creating mission-driven music, arts and community service organizational structures. SPRING. [2] Korn.

**MENT 3100. Career Preparedness: The Business of a Music Professional.** [Formerly MUSO 201] Prepares students for a career in music and its related fields. Emphasis on essential skills for resumé writing, financial management, interviewing/auditioning, media relations, copyright/ownership, career adaptability, and developing an artistic vision. Prerequisite: Junior and senior Bachelor of Music students and second majors in music. FALL. [1] Korn.

**MENT 3110. 21st Century Artistry: Advanced Skills in Live Performance, Technology and Communication.** [Formerly MUSO 233] Skills for artistry, employment, audience engagement, communications, and the business of live music performance and recording. Emphasis on live and recorded stage and communication presentation; utilization of laptops as recording and live technologies; and creative application of technology, creativity, advocacy and business skills for employment. Prerequisite: MUTH 2400 or permission of instructor. FALL. [3] Korn.

**MENT 3880. Music Internship (1 credit).** [Formerly MUSO 280A] Academic research and writing related to a corequisite internship experience under the direction of a faculty sponsor. Prerequisite: 2.9 GPA, sophomore standing, and approval of project prospectus by faculty sponsor and by Associate Dean. May be repeated for credit, up to 1 credit per semester of enrollment. FALL, SPRING. [1].

**MENT 3881. Music Internship (3 credit hours).** [Formerly MUSO 280B] An extensive academic program of study related to a corequisite internship experience under the direction of a faculty sponsor. Prerequisite: 2.9 GPA, sophomore standing, and approval of project prospectus by faculty sponsor and by Associate Dean. May be repeated for credit, up to 3 credit hours per semester of enrollment. FALL, SPRING, SUMMER. [3].

**MENT 3882. Summer Music Internship.** [Formerly MUSO 280C] Academic research and writing related to a corequisite internship experience under the direction of a faculty sponsor. Prerequisite: 2.9 GPA, sophomore standing, and approval of project prospectus by faculty sponsor and by Associate Dean. Offered on a pass/fail basis only. May be repeated for credit, up to 1 credit hour per semester of enrollment. SUMMER. [1].

## MPED: Pedagogy

**MPED 3100. Guitar Pedagogy.** [Formerly MUSO 268] Principles and procedures of teaching classical guitar. Instructional methods and their applications with different age levels. Attention given to individual and group instruction. SPRING. [2] Todd. (Offered alternate years)

**MPED 3110. Piano Pedagogy.** [Formerly MUSO 266] Principles and procedures of teaching piano. Individual and group instruction techniques observed and discussed. Practicum with private students. Designed for piano majors; others admitted with consent of instructor. FALL. [2] Krieger. (Offered alternate years)

**MPED 3120. Suzuki Violin Pedagogy.** [Formerly MUSO 265A] Principles and procedures of teaching violin using the Suzuki Violin School, books 1-4. Individual and group instruction techniques observed and discussed. Designed for junior or senior violin/viola students. Violin for class use required. Open by consent of instructor. FALL [3] Carol Smith. (Offered alternate years)

**MPED 3121. Suzuki Violin Pedagogy.** [Formerly MUSO 265B] Principles and procedures of teaching violin using the Suzuki Violin School,

books 14. Individual and group instruction techniques observed and discussed. Designed for junior or senior violin/viola students. Violin for class use required. Open by consent of instructor. Prerequisite: MPED 3120. SPRING [3] Carol Smith. (Offered alternate years)

**MPED 3130. Vocal Pedagogy.** [Formerly MUSO 269] Principles and procedures of teaching voice. Psychological and physiological approaches. Practicum with private students. Corequisite: VOIC 4100 or VOIC 4200. FALL. [2] Nelson. (Offered alternate years)

**MPED 3140. Woodwind Pedagogy.** Principles and procedures of teaching woodwind instruments. Emphasis on pedagogical literature and specific teaching techniques. Prerequisite: B.Mus. students with completion of four semesters of 2100 or 2200 in major instrument, or permission of instructor.[2] Woodwind faculty. (Offered alternate years)

**MPED 3870. Pedagogy Practicum.** [Formerly MUSO 271] Principles and procedures of private teaching. Reading and research under the direction of a faculty sponsor, consistent with requirements for Independent Study. Practicum with private students. Consent of the faculty sponsor is required. [Repeatable for credit, variable 1-2 hours each semester.] Staff.

**MPED 3880. Pedagogy Internship.** [Formerly MUSO 281] Focused experience in the teaching of performance under the direction of a faculty sponsor in that performance area (consent required). Involves a specific program of regular consultation between student and supervising teacher. Open only to students seeking concentration in pedagogy. Prerequisite: MREP 3310 or 3311, 3300, 3330, or MUSO 3850 (in field) and MPED 3110, 3100, or 3130 or MUSO 3850 (in field). [Repeatable for credit, variable 1-3 hours each semester.] Staff.

## MREP: Orchestral Repertoire and Instrument Literature

**MREP 2110. Brass Orchestral Repertoire.** [Formerly MUSO 252] Exploration of the standard orchestral repertoire with emphasis on the late Romantic period. Performance of selected excerpts, coached and conducted. May be repeated for credit. FALL. [2] Wilson.

**MREP 2120. Orchestral Repertoire for Percussion.** [Formerly MUSO 253A] Exploration of the standard orchestral repertoire for percussion instruments, exclusive of timpani, with emphasis on score analysis, instrument selection, and performance techniques. Selected excerpts coached and conducted. SPRING. [1] Jung. (Offered alternate years)

**MREP 2121. Orchestral Repertoire for Timpani.** [Formerly MUSO 253B] Exploration of the standard orchestral repertoire for timpani. Emphasis on score analysis, editing, stick selection, and performance practice. Selected excerpts coached and conducted. FALL. [1] Wiggins. (Offered alternate years)

**MREP 2130. String and Harp Orchestral Repertoire.** [Formerly MUSO 254A] Analysis and coaching of the standard orchestral repertoire, including opera and ballet, with emphasis on style and technical problems. Selected excerpts in like instrument groups (violin, viola, cello, bass, harp). May be repeated for credit. [1] Iwasaki, Jaskunas, Mansell, Reinker, Reist, Wanner.

**MREP 2140. Woodwind Orchestral Repertoire.** [Formerly MUSO 251] Exploration of the standard orchestral repertoire with emphasis on performance practice. Performance of selected excerpts, coached and conducted. Not recommended for freshmen. May be repeated for credit. SPRING. [1] Woodwind faculty.

**MREP 2141. Saxophone Orchestral and Wind Band Repertoire.** Exploration of the standard orchestral and wind band repertoire with emphasis on performance practice. Performance of selected excerpts, coached and conducted. Not recommended for freshmen. Prerequisite: B.Mus. students or permission of instructor. SPRING. [1] Utley.

**MREP 3300. Guitar Literature.** [Formerly MUSO 258] Survey of literature for the classical guitar from the sixteenth century to the twentieth century. Various systems of notation including lute and vihuela are explored. FALL. [2] Todd. (Offered alternate years)

**MREP 3310. Piano Literature I.** [Formerly MUSO 256A] A survey of works for piano from the seventeenth through the nineteenth centuries, within the context of historical perspective, stylistic awareness, and pianism. Designed primarily for piano majors. SPRING. [2] Nies, Wait. (Offered alternate years)

**MREP 3311. Piano Literature II.** [Formerly MUSO 256B] A survey of works for piano from the nineteenth through the twenty-first centuries, within the context of historical perspective, stylistic awareness, and pianism. Designed primarily for piano majors. FALL. [2] Nies, Wait. (Offered alternate years)

**MREP 3330. Vocal Literature.** [Formerly MUSO 259] Survey of literature for solo voice from the seventeenth century to the present, with focus on traditional art songs of the great masters of the genre. Prerequisite: MUTH 2300, MUSL 2200W. Corequisite: VOIC 4100 or VOIC 4200. FALL. [2] Jarman. (Offered alternate years)

## MUED: Teacher Education

**MUED 1010. Woodwind Methods.** [Formerly MUST 101] Development of performance skills and teaching methods for flute, clarinet, oboe, bassoon, and saxophone. Includes teaching techniques and problems relative to woodwind instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students; or permission of instructor. FALL. [1] Utley.

**MUED 1020. Brass Methods.** [Formerly MUST 102] Development of performance skills and teaching methods for trumpet, french horn, trombone, euphonium, and tuba. Includes teaching techniques and problems relative to brass instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students; or permission of instructor. SPRING. [1] Beckman.

**MUED 1030. Strings Methods.** [Formerly MUST 103] Development of performance skills and teaching methods for violin, viola, cello, and double bass. Includes teaching techniques and problems relative to string instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students; or permission of instructor. FALL. [1] Bingham.

**MUED 1040. Percussion Methods.** [Formerly MUST 104] Development of performance skills and teaching methods for snare drum, timpani, mallet instruments, and other percussion instruments. Includes teaching techniques and problems relative to all percussion instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students; or permission of instructor. FALL. [1] Wiggins.

**MUED 1050. Classroom Instruments Methods.** [Formerly MUST 105] Development of performance skills and teaching methods for instruments such as recorder, Orff, classroom percussion, and others. Includes methods and materials for elementary general music, emphasizing development of children's ability to sing and play classroom instruments. Open only to B.Mus. students; or permission of instructor. SPRING. [1] Alley.

**MUED 1060. Child and Adolescent Voices.** [Formerly MUST 106] A study of the vocal development and maturity of children from pre-K through high school with an emphasis on healthy production, pitch-matching skills, learning styles, warm-up exercises, the changing voice in boys and girls, and examples of appropriate literature. Open only to B.Mus. students; or permission of instructor. SPRING. [1] P. Schneller

**MUED 1070. Secondary Instrument Lab.** [Formerly MUST 107] Development of performance skills and teaching methods on a secondary instrument while in an ensemble setting. Includes methodologies prescribed for teaching secondary band and orchestra. Open only to B.Mus. students; or permission of instructor. Prerequisite: MUED 1010 or 1020 and MUED 1030. SPRING. [1] Perez.

**MUED 2110. Seminar in Teaching Choral Literature.** [Formerly MUST 211] Teaching techniques and knowledge of choral repertoire as applicable to K12 choral programs. Tonal, harmonic, and melodic analysis, score marking and preparation, and classroom concerns. Repertoire

drawn from the National American Choral Directors' Association reading lists, All-State honor choir lists, and other applicable sources to encompass a broad range of genres, styles, levels of difficulty, ethnicities, and musical periods. Prerequisite: MUTH 2200 and approval of instructor. SPRING. [2] T. Biddlecombe. (Offered alternate years)

**MUED 2120. Seminar in Teaching Orchestra.** [Formerly MUST 212] Instructional strategies for string and full orchestras from the middle school through high school and youth orchestra levels. Topics to include rehearsal techniques, repertoire, materials, secondary string class instruction, and performance practices. Prerequisite: MUED 1030 and MCON 3000, or permission of instructor. SPRING. [2] Wei-Tsun Chang. (Offered alternate years)

**MUED 2130. Seminar in Orff/Kodály Methods.** [Formerly MUST 213] Teaching general music with emphasis on Orff and Kodály principles and practices. Planning, instruction, and evaluation using techniques and materials from a variety of sources. FALL. [2] Ramsey. (Offered alternate years)

**MUED 2140. Seminar in Teaching Jazz Styles.** [Formerly MUST 214] Principles and practices for teaching instrumental jazz styles. Rehearsal techniques (including observation), repertoire, jazz education philosophies, and stylistic elements for soloists, combos, and larger ensembles. Prerequisite: MUSO 1220 or permission of instructor. SPRING. [2] Middagh.

**MUED 2150. Seminar in Teaching Marching Band.** [Formerly MUST 215] Techniques and materials for Marching Band instruction. Organization, administration, literature, technology, auxiliary groups. Planning, writing, arranging and teaching halftime performances. Prerequisite or corequisite: MCON 3000 or permission of instructor; corequisite: participation in marching band. FALL. [2] Beckman.

**MUED 2160. Seminar in Teaching Musicianship.** [Formerly MUST 216] Principles and procedures involved in teaching aural musicianship to K12 students, in both private and classroom environments. Lecture, discussion plus interactive activities that explore musical perception and cognition. Prerequisite: MUSC 2400. FALL. [2] Ploger. (Offered alternate years)

**MUED 2170. Seminar in Teaching Band.** [Formerly MUST 217] Knowledge of repertoire and teaching techniques as applicable to grades 4-12 band programs. Repertoire to be drawn from several states' standardized lists that employ comprehensive musicianship in teaching and meeting national standards. SPRING. [2] Beckman.

**MUED 3870. Practicum in Music Teaching.** [Formerly MUST 250A] Observation, participation, and supervised music teaching in a variety of school, grade level, and instructional music settings, designed to integrate and apply musical knowledge and teaching skills developed within the degree program. Weekly seminar included. Includes SMART music studio technology and GarageBand technology. SPRING. [1] Perez.

**MUED 3871. Practicum in Music Teaching II.** [Formerly MUST 250B] Observation, participation, and supervised music teaching in a variety of school, grade level, and instructional music settings, designed to integrate and apply musical knowledge and teaching skills developed within the degree program. Weekly seminar included. Prerequisite: MUED 3870. SPRING. [1] Perez.

**MUED 3872. Practicum in Music Teaching III.** [Formerly MUST 250C] Observation, participation, and supervised music teaching in a variety of school, grade level, and instructional music settings, designed to integrate and apply musical knowledge and teaching skills developed within the degree program. Weekly seminar included. Prerequisite: MUED 3871 and any two from MUED 2110-2170. SPRING. [1] Biddlecombe, Perez.

**MUED 5000. Philosophical Foundations and Contemporary Issues in Music Teaching.** [Formerly MUST 300] A comprehensive study of historical trends and philosophies relevant to music teaching. Readings and discussions of the practical application of educational research studies to music teaching. SUMMER. [3] Perez.

**MUED 5010. Methods and Materials in Instrumental Music.** [Formerly MUST 320] Techniques and materials for teaching instrumental music from elementary through senior high school. Emphasizes instrumental organization, administration, pedagogical practices, and developing school instrumental music programs. FALL. [3] Verrier.

**MUED 5020. Methods and Materials in Vocal/Choral Music.** [Formerly MUST 330] Techniques and materials for teaching vocal/choral music from elementary through senior high school. Emphasizes vocal music organization, administration, and pedagogical practices. FALL. [3] Biddlecombe.

**MUED 5030. Methods and Materials in General Music, PreK through 12.** [Formerly MUST 340] Techniques and materials for teaching general music, PreK through 12. Classroom organization, administration, pedagogical practices, and general musical activities such as Orff, Kodály, Dalcroze. FALL. [3] Alley.

**MUED 5100. Advanced Studies for the Wind Band Conductor.** [Formerly MUST 317] Knowledge of concert band repertoire as applicable to band programs from intermediate to advanced levels. Score preparation, rehearsal strategies, and expansion of conducting skills to include longer and more complex musical structures. Specific emphasis on developing historical and pedagogical context for repertoire evaluation and selection. Repertoire to encompass a broad range of genres, styles, and levels of difficulty. FALL. [2] Verrier.

## MUKH: Keyboard Harmony

**MUKH 1130. Introductory Keyboard Harmony.** [Formerly MUSC 130] Introduction to repertoire, technique, transposition, harmonization, improvisation, and sight reading. Designed for B.Mus. students who have no piano background. Provides preparation for the Keyboard Harmony sequence. FALL. [1] Koutsoukos, May.

**MUKH 1131. Keyboard Harmony I.** [Formerly MUSC 131A] Development of basic technique, reading proficiency, elementary transposition. Diatonic harmony at the keyboard. Prerequisite: placement test. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos, May.

**MUKH 1132. Keyboard Harmony II.** [Formerly MUSC 131B] Development of basic technique, reading proficiency, elementary transposition. Diatonic harmony at the keyboard. Prerequisite: placement test or MUKH 1131. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos, May.

**MUKH 1133. Keyboard Harmony III.** [Formerly MUSC 132A] Harmonization of melodies, improvisation of small musical forms, transposition in all keys with cadences and modulations, four-part score reading. Prerequisite: MUKH 1132. Strongly recommended: C- or above in 1132. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos, May.

**MUKH 1134. Keyboard Harmony IV.** [Formerly MUSC 132B] Harmonization of melodies, improvisation of small musical forms, transposition in all keys with cadences and modulations, four-part score reading. Prerequisite: MUKH 1133. Strongly recommended: C- or above in 1133. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos.

**MUKH 2133. Accelerated Keyboard Harmony I.** [Formerly MUSC 133A] Functional skills are reinforced with pedagogy, music theory, harmony, and ear training. Topics include improvisation, musical styles, and computer MIDI technology. For keyboard majors or by consent of instructor. Prerequisite: placement test. Not open to students who have completed MUKH 1131-1132 or 1133-1134. FALL. [2] Krieger.

**MUKH 2134. Accelerated Keyboard Harmony II.** [Formerly MUSC 133B] Intensive study of materials presented in MUKH 2133. Prerequisite: 2133. Strongly recommended: C- or above in 2133. Not open to students who have completed 1133, 1134. SPRING. [2] Krieger.

## MUSC: Musicianship

**MUSC 2100. Musicianship Level I.** [Formerly MUSC 170E] Examination of the sound properties of pitches, intervals and rhythms and their notation in real time. Focus is on diatonic scales and modes. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Corequisite: MUTH 2100. FALL. [1] McGuire, Williams.

**MUSC 2200. Musicianship Level II.** [Formerly MUSC 171E] Continuation of Musicianship Level I. Focus on the employment of pitches, intervals and rhythms in functional tonal contexts. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Prerequisite: MUSC 2100; corequisite: MUTH 2200. SPRING. [1] McGuire, Williams.

**MUSC 2300. Musicianship Level III.** [Formerly MUSC 172E] Continuation of Musicianship II. Focus on tonal modulation and chromaticism. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Prerequisite: MUSC 2200; corequisite: MUTH 2300. FALL. [1] McGuire.

**MUSC 2400. Musicianship Level IV.** [Formerly MUSC 173E] Continuation of Musicianship III. Focus on the employment of pitches, intervals and rhythms in non-tonal contexts. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Prerequisite: MUSC 2300; corequisite: MUTH 2400. SPRING. [1] McGuire.

**MUSC 3105. Advanced Musicianship V.** [Formerly MUSC 271E] Further development of aural skills, including techniques for hearing, singing, reading, and writing tonal and atonal music in real time. Prerequisite: MUSC 2400. FALL. [1] Ploger.

**MUSC 3106. Advanced Musicianship VI.** [Formerly MUSC 272E] Further development of aural skills, including techniques for hearing, singing, reading, and writing tonal and atonal music in real time. Prerequisite: MUSC 3105. SPRING. [1] Ploger.

**MUSC 3107. Advanced Musicianship VII.** [Formerly MUSC 273E] A continuation of techniques studied in MUSC 3106. Hearing in tonal and atonal music, including extended harmonic and melodic structures, complex rhythmic elements, and score reading. Discussion of pedagogical approaches to teaching aural studies. Prerequisite: MUSC 3106. FALL. [1] Ploger

**MUSC 3108. Advanced Musicianship VIII.** [Formerly MUSC 274E] A continuation of techniques studied in MUSC 3107. Hearing in tonal and atonal music, including extended harmonic and melodic structures, complex rhythmic elements, and score reading. Discussion of pedagogical approaches to teaching aural studies. Prerequisite: MUSC 3107. SPRING. [1] Ploger

**MUSC 3109. Musicianship: Brahms and Romanticism; Solo and Small Chamber Works.** [Formerly MUSC 276E] A study of skills needed to perform, aurally comprehend and mentally analyze the solo vocal and instrumental plus small chamber works for strings, winds and keyboard of Brahms, with comparative studies of works of Schumann and Chopin. Lecture, discussion, guided listening exercises, class performance participation and score reading. Prerequisite: MUSC 2400. [1] Ploger. (Not currently offered)

**MUSC 5110. Intensive Musicianship I.** [Formerly MUSC 341A] Intensive immersive musical instruction modeled on language acquisition process, designed to provide musicians with practical skills in real-time aural processing, including interval identification, reading and notating pitch and rhythm, facility in each of the diatonic modes, aural tracking of multiple simultaneous parts. Open by instructor approval. SUMMER. [1] Ploger.

**MUSC 5120. Intensive Musicianship II.** [Formerly MUSC 341B] Intensive immersive musical instruction modeled on language acquisition process, designed to provide musicians with practical skills in real-time aural processing, including interval identification, reading and notating pitch and rhythm, facility in each of the diatonic modes, aural tracking

of multiple simultaneous parts. Open by instructor approval. SUMMER. [1] Ploger.

**MUSC 5130. Intensive Musicianship III.** [Formerly MUSC 342] Continuation of materials covered in Intensive Musicianship MUSC 5110 and 5120, including further real-time aural processing, with discussion of pedagogical approaches to teaching musicianship using a language-acquisition model. Prerequisite: MUSC 5120. SUMMER. [1] Ploger.

## MUSE: Ensembles

All MUSE courses are repeatable. Students may accrue up to 6 credit hours per semester of enrollment.

**MUSE 1010. Instrumental Ensembles.** [Formerly MUSE 101] Open by audition to all Vanderbilt students. Musicians participate in orchestra, wind ensembles, and/or a variety of smaller ensembles on a rotational basis through the course of the semester. Performances include symphonic repertoire from the Classical and Romantic periods as well as standard and new repertoire from Baroque to Contemporary. At least three formal concerts are presented each semester. [1] Fountain, Verrier.

**MUSE 1020. Vanderbilt Symphonic Choir.** [Formerly MUSE 101A] Open by audition to all members of the Vanderbilt community, this choral ensemble performs literature requiring large forces, such as masses and oratorios. At least one formal concert each semester and at least one work each year with the Vanderbilt Orchestra. [1] Biddlecombe.

**MUSE 1030. Vanderbilt Opera Theatre.** [Formerly MUSE 101F] Open by audition to all Vanderbilt students. Performance material chosen from all forms of lyric theatre: standard operatic repertoire, operetta, and American musical theatre. At least one production is presented. FALL MODULE B. [1] Shay.

**MUSE 1120. Guitar Ensemble.** [Formerly MUSE 204] Open by consent of instructor. [1] Todd, Phillips.

**MUSE 1130. Harp Ensemble.** [Formerly MUSE 209] Open by consent of instructor. [1] Jaskunas.

**MUSE 1140. Percussion Ensemble.** [Formerly MUSE 210] Open by consent of instructor to all Vanderbilt percussionists, this ensemble performs repertoire from the 1930's (works by composers such as Harrison, Cowell, Cage, et al.) to the current influences of De La Guarda, Blue Man Group, technology, multi-media, and broad theatrical concepts. Group sizes and use of a conductor vary according to repertoire. At least one formal concert per semester. [1] (Not currently offered)

**MUSE 1160. Saxophone Ensemble.** [Formerly MUSE 207] Open by consent of instructor. [1] Utley.

**MUSE 1200. Steel Drum/Pan Ensemble.** [Formerly MUSE 150A] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on Caribbean steel drums/pans with emphasis on the music and dance repertoires of the island of Trinidad. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. No previous experience required. [1] Britain.

**MUSE 1210. Steel Drum/Pan Ensemble.** [Formerly MUSE 150B] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on Caribbean steel drums/pans with emphasis on the music and dance repertoires of the island of Trinidad. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. Ability to read musical notation required. [1] Britain.

**MUSE 1220. Steel Drum/Pan Ensemble.** [Formerly MUSE 150C] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on Caribbean steel drums/pans with emphasis on the music and dance repertoires of the island of Trinidad. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. Ability to read musical notation required. Prerequisite: MUSE 1200 or 1210. [1] Britain.

**MUSE 1230. African Performing Ensemble.** [Formerly MUSE 171] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on traditional African musical instruments (drums, percussion, winds) with an emphasis on West African (Ghana) and East African (Uganda) music and dance repertoires. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. No previous experience required. [1] Ahima.

**MUSE 1240. Fiddle Ensemble.** [Formerly MUSE 212] Open by audition to all Vanderbilt students with fiddling experience. One hour weekly coaching by visiting fiddlers from the community. Fiddle tunes, harmonies, and improvisation ideas in various styles of fiddle music, including old-time, bluegrass, swing, Celtic, and contemporary. One performance each semester. [1] Combs, Plohman.

**MUSE 1310. Jazz Ensemble: Big Band.** [Formerly MUSE 131] Open by audition to all Vanderbilt students, this ensemble performs both traditional and modern jazz styles, including dance band, swing, contemporary, and charts currently under development. Improvisation, jazz timbres, and other idiomatic concepts explored through lecture-demonstration and performance. At least one concert is presented each semester. [1] Middagh.

**MUSE 1320. Jazz Ensemble: Small Combo.** [Formerly MUSE 132] Open by audition to all Vanderbilt students. Provides focused laboratory training for performance of composed and improvised small combo jazz traditions. Discussion and application of techniques associated with solo, sectional, and ensemble performance in jazz. At least one concert is presented each semester. [1] Coffin, Spencer.

**MUSE 1330. Blair Jazz Choir.** Open by audition to all Vanderbilt students; ensemble is limited to 12 voices, plus rhythm section. Repertoire includes scat, contemporary, and standard jazz. On- and off-campus performances throughout the semester. [1] Watson.

**MUSE 2120. Vanderbilt Chorale.** [Formerly MUSE 201A] Open by audition to all Vanderbilt students, this select 36-40 voice choral ensemble performs music in a variety of styles. At least two formal concerts each semester. [1] Biddlecombe.

**MUSE 2210. Instrumental Chamber Music.** [Formerly MUSE 221] Open to all Vanderbilt students by audition or upon recommendation of the private instructor. Size of ensembles may vary. One hour weekly coaching. Two hours of additional rehearsal each week. [Variable credit: ½, 1, or 2 each semester] Dikeman, Dorfman, Hauser, Jackson, Kochanowski, Kolkay, Long, Miahky, Melissa Rose, Wilson, performance faculty.

**MUSE 2220. Chamber Music: Percussion.** [Formerly MUSE 215] Open to percussion majors and minors. Size of ensembles will vary. One hour weekly coaching and two hours of additional rehearsal (independent of coaching) expected each week. [½ or 1] Jung.

**MUSE 2230. Chamber Music: Sonata Class for Strings and Piano.** [Formerly MUSE 223] One hour weekly class for performance and study of string (violin, viola, cello, bass) and piano sonatas from the standard repertoire, baroque through modern, with each sonata duo receiving thirty minutes of coaching within the class time. Performance of complete sonata during the last class of the semester. Two hours of additional rehearsal each week. Open by consent of instructor. [1] Dorfman, Plummer.

**MUSE 2240. Chamber Music: String Quartet.** [Formerly MUSE 224] Open by consent of instructor. One hour of coaching and at least two hours of additional rehearsal each week. [Variable credit: ½, 1, or 2 each semester] Kochanowski, Miahky.

**MUSE 2250. Chamber Music: Brass Quintet.** [Formerly MUSE 225] Open by consent of instructor. [½ or 1] Sibaja, Long, Wilson.

**MUSE 2260. Chamber Music: Woodwind Quintet.** [Formerly MUSE 226] Open by consent of instructor. [½ or 1] Dikeman, Hauser, Jackson, Kolkay.

**MUSE 2270. Baroque Chamber Music.** Open to all Vanderbilt students with experience on Baroque instruments or upon recommendation of the private instructor. Size of ensembles may vary. Students will

receive one hour of coaching and are expected to rehearse at least two additional hours each week. [Variable credit: ½, 1, or 2 each semester] Nyquist.

**MUSE 2300. Collaborative Techniques for Pianists.** [Formerly MUSE 102] Basic techniques of vocal and instrumental collaboration. Choral/orchestral score reading, orchestral reductions, continuo realization, modern editions of early music, musical terms, diction, and ensemble techniques. Performance of vocal and instrumental accompaniments. Both group and individual coaching. Open only to B.Mus. piano majors in fall; by consent of instructor in spring. [1] Melissa Rose.

**MUSE 2310. Collaborative Piano: Instrumental.** [Formerly MUSE 222] Introduces pianists to collaboration with instrumentalists. Weekly coaching with piano instructor and 5 hours practice/rehearsal per week. Standard instrumental repertoire will be assigned. Open by consent of instructor. [Variable credit: ½, 1, or 2 each semester] Dorfman, Nies, Melissa Rose.

**MUSE 2320. Collaborative Piano: Vocal.** [Formerly MUSE 201B] Introduces pianists to collaboration with singers. Weekly coaching with piano instructor and 5 hours practice/rehearsal per week. Focus on standard art song and opera repertoire. Open by consent of instructor. [Variable credit: 1-2 each semester] Dorfman, Nies, Melissa Rose.

**MUSE 2330. Vocal Chamber Music.** [Formerly MUSE 201D] Open by consent of the instructor. One hour weekly coaching for vocal/instrumental duos or ensembles, including singer/piano duos. Two hours of additional rehearsal each week. [Variable credit: ½, 1, or 2 each semester] Dorfman, Melissa Rose.

## MUSL: Music Literature and History

**MUSL 1100. World Music.** [Formerly MUSL 160] World music as a cultural product; selected musics of Africa, Native America, India, Indonesia, and African America. Topics include music and religion, popular music, field work methodology, and gender issues. Not open to students who have completed MUSL 2100. FALL. [3] Barz, Fry.

**MUSL 1105. African Music.** [Formerly MUSL 171] A survey of selected traditional and popular music of Africa. Historical, social, and cultural contexts; listening; some performances in class. SPRING. [3] Barz.

**MUSL 1111. First-Year Writing Seminar.** [Formerly MUSL 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through class discussion, oral presentations, and written expression. Topics vary. Open to freshmen only. FALL. [3] Musicology and Ethnomusicology faculty.

**MUSL 1200. Introduction to Music Literature.** [Formerly MUSL 140] An introduction to the literature of music from A.D. 600 to the present through a study of selected works. Extensive listening is required. Not open to students who have completed MUSL 2200W. Does not count toward a major in music. FALL, SPRING. [3] Hime.

**MUSL 1210. The Concerto.** [Formerly MUSL 143] A close study of representative works, from the Baroque invention of the concerto principle up to modernist and contemporary adaptations. Focus on structural listening. No previous training in music required. FALL. [3] Michael Rose. (Offered alternate years)

**MUSL 1220. The Symphony.** [Formerly MUSL 144] Orchestral literature with emphasis on the evolution of symphonic form and style, through the study of selected masterworks of the standard repertoire. FALL. [3] Hime, Michael Rose.

**MUSL 1230. Survey of Choral Music.** [Formerly MUSL 145] Choral literature, sacred and secular, from the Renaissance to the present, with emphasis on a study of selected masterworks from each period. SPRING. [3] Hime.

**MUSL 1300. Music, the Arts, and Ideas.** [Formerly MUSL 183] The changing historical relationships among music, literature, fine arts, and philosophy. Musical developments as responses to social, political, and economic circumstances. FALL. [3] Link.

**MUSL 1310. Love and Death in Music.** [Formerly MUSL 184] Perspectives on two great problems of human life throughout the history of Western music. Themes include idealized love, sexual pathology, love and realism, love of God, confronting death, transcending death. Connections of music to visual arts, literature, film. No musical background required. [3] Michael Rose. (Offered alternate years)

**MUSL 1320. The Music of the Outliers.** Seminar centering on the music of composers who were/are unorthodox in their thinking, who resisted prescribed notions of what music is and challenged the world around them to think about sound in new ways. Topics include the "reactionary" climate of the twentieth century; modernism and post-modernism; electronics in music; minimalism and microtonalism; performance art and "Art-Pop." Not open to students who have completed MUTH 2400. Does not count toward a major in music. No prior experience in music necessary. Maymester [3] Slayton

**MUSL 1600. American Popular Music.** [Formerly MUSL 149] Historical study of ways the culture of a nation is reflected and sometimes shaped by the chosen musics of the groups comprising the American "salad bowl." Topics include audience reception, production and consumption, multiculturalism, and meaning. SPRING. [3] Gunderman.

**MUSL 1610. Musical Theatre in America: A Cultural History.** [Formerly MUSL 103] From eighteenth century melodrama and vaudeville through the musicals of the 1940s and 1950s to the contemporary emphasis on integration of spectacle, dance, and other theatrical arts. Readings, live productions, guest lecturers, and film. SPRING. [3] Lovensheimer. (Offered alternate years)

**MUSL 1620. Survey of Jazz.** [Formerly MUSL 148] A survey of jazz history, with particular attention to the major composers "Jelly Roll" Morton, Duke Ellington, and Thelonius Monk, who gave the music synthesis and form, and to its major innovative soloists, Louis Armstrong, Charlie Parker, and Ornette Coleman, who renewed its musical language. FALL, SPRING. [3] Fry.

**MUSL 1630. The Blues.** [Formerly MUSL 151] Downhome, classic, Chicago, and urban blues-history, musical structure, musical styles, singers' lives, and meanings of blues lyrics. The current blues revival, blues and tourism, race and revisionist blues scholarship, and the relation of blues to African American poetry and fiction. Artists such as Ma Rainey, Charley Patton, Robert Johnson, Lightnin' Hopkins, Muddy Waters, B.B. King, Buddy Guy, Robert Cray. SPRING. [3] Fry.

**MUSL 1640. Country Music.** [Formerly MUSL 152] A musical and cultural survey of the talents, traditions, and trends of country music from its Colonial roots to its current status as a multi-million dollar global industry. Focus on the music, creators, and performers of that music and its cultural and social contexts. FALL, SPRING. [3] Cooper.

**MUSL 1650. History of Rock Music.** [Formerly MUSL 153] History and development of rock and roll music and its performance from the 1950s to the present. Major artists from each decade, subgenres (rockabilly, R&B, folk, soul, metal, pop, alternative, etc.), and technological, cultural, and economic developments that helped shape the music. FALL, SPRING. [3] Gunderman.

**MUSL 1660. Music and Tourism: Music City Museum & Memorabilia.** [Formerly MUSL 265] An exploration of the intersection between popular music and tourism. Music landmarks as tourist attractions, music memorabilia and museums, tourism and urban development, souvenirs as travel credentials, and tourism and issues of representation. [3] Fry.

**MUSL 2100. Music as Global Culture.** [Formerly MUSL 122] Music and musical cultures from around the world. Students will approach indigenous music theories on their own terms in order to understand and complement the complexities of contemporary Western Music performance styles and expectations. Emphasis on fundamental elements (e.g., rhythm, pitch, harmony, and form) of diverse musical practices. Transcription, notation, and analysis of a variety of melodic and rhythmic forms. Not open to students who have completed MUSL 1100. Prerequisite: Open to B.Mus. students, declared second majors, or with demonstrated musical literacy and permission of instructor. FALL. [3] Fry.

**MUSL 2110. Music in Latin America and the Caribbean.** [Formerly MUSL 250] An introduction to a wide variety of musical genres and traditions in Latin America and the Caribbean. Indigenous, folk, popular, and art music forms and their social function, meaning, historical development, cultural blending, and cross-hybridization. SPRING. [3]

**MUSL 2150. Music, Identity, and Diversity.** [Formerly MUSL 261] Issues of multiculturalism and intersections with musical expression in America. Cultural determinants, such as race, gender, ethnicity, class, religion, language, ideology, folklore, and history will be studied critically. Prerequisite: Any MUSL course or AMER 1002. FALL.

**MUSL 2200W. Music in Western Culture.** [Formerly MUSL 121W] An overview of music in the Western art tradition, including its basic historical periods, styles, genres and disciplines. Tangible applications of historical, analytical, and cultural thinking to musical performance. Guided discussion, varied writing assignments, and presentations. Prerequisite: Open to B.Mus. students, declared music minors/second majors, or with demonstrated musical literacy and permission of instructor. SPRING. [3] Musicology faculty.

**MUSL 2310. The Bible and Music.** [Formerly MUSL 219] An investigation of Biblical texts (Old Testament/Tanach; Deuterocanonical texts/Old Testament Apocrypha; New Testament) that have inspired musical settings and the musical settings themselves. Emphasis on literary and musical analysis and interpretation. No musical or scriptural background assumed. FALL. [3] Michael Rose and Amy-Jill Levine, University Professor of New Testament and Jewish Studies.

**MUSL 2320. Exploring the Film Soundtrack.** [Formerly MUSL 264] Relationships among soundtrack, image, and narrative in film. The complex of music, sound, and dialog in a variety of American films, from silents to Hollywood blockbusters and cartoons. Topics include diegesis, temporality, continuity, and musical style. Discussion, video, and film research, reading, and listening. No musical background required. SPRING. [3] Link.

**MUSL 2330. Words and Music.** [Formerly MUSL 218] An investigation of works of literature that have inspired musical settings and the musical settings themselves. Emphasis on literary and musical analysis and interpretation. No musical background assumed. Repeat credit for students who have completed ENGL 3736. [3] Michael Rose and Mark Jarman, Centennial Professor of English.

**MUSL 2600. American Music.** [Formerly MUSL 147] A history of music in the United States, 1620 to the present. Distinctly American musical traditions such as shape-notes, minstrelsy, jazz, twentieth-century syntheses. Recommended: MUSL 2200W or 1200, or music-reading skills sufficient to follow a score. FALL. [3] Lovensheimer.

**MUSL 2610. Music of the South.** [Formerly MUSL 262] The musical riches of the American South approached from various perspectives, including the historical, cultural, social, political, and religious. Blues, country, and gospel are the primary genres of study; jazz, folk, and classical traditions in the South also receive attention. Prerequisite: Any MUSL course or AMER 1002. [3] Fry. (Offered alternate years)

**MUSL 3100. Music of the 20th and 21st Centuries.** [Formerly MUSL 239] An exploration of the wealth and diversity of European and American art music since 1900. Emphasis on the historical, cultural, philosophical, and technological contexts that encourage an approach to this music on its own terms. Prerequisite: B.Mus. students and second majors, MUSL 2200W and 2100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Calico, Lovensheimer.

**MUSL 3150. Music, Gender, and Sexuality.** [Formerly MUSL 201] Exploration of gender and sexuality in Western art and vernacular musical traditions. Topics include gendered musical forms, genres, and performance; feminist music criticism; ideologies of musical authorship and genius; musical canons; and musical representations of gender and sexuality. Prerequisite: MUSL 2200W or 1200 and ability to read a score. SPRING. [3] Lowe. (Offered alternate years)

**MUSL 3155. Women and Music.** [Formerly MUSL 200.] An investigation of the roles women have played in the development of Western music—performance, composition, patronage, education—and the

social and economic factors that have influenced their position. Recommended: MUSL 2200W, 1200, or familiarity with the style periods of classical Western music. [3] Cyrus. (Offered alternate years)

**MUSL 3160. Women and Rock Music.** [Formerly MUSL 253] An exploration of the ways that women have made their voices heard in rock on stage, in the studio, behind the scenes, and as fans. Prerequisite: Any MUSL or WGS course. SPRING. [3] Gunderman.

**MUSL 3220. Opera in the 17th and 18th Centuries.** [Formerly MUSL 221A] In-depth study of five or six representative works. Score and libretto analysis, reception history, cult of the performer, role of the contemporary producer-director. B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. Not open to students who completed MUSL 221 prior to Fall 2011. FALL. [3] Calico.

**MUSL 3221. Opera in the 19th Century.** [Formerly MUSL 221B] In-depth study of five or six representative works. Score and libretto analysis, reception history, cult of the performer, role of the contemporary producer-director. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. Serves as repeat credit for MUSL 221. FALL. [3] Calico.

**MUSL 3222. Mahler Symphonies: Songs of Irony.** [Formerly MUSL 222] An exploration of large orchestral works of Gustav Mahler emphasizing their demonstration of the synthesis of symphony and song and their reflection of nineteenth-century German philosophies of irony. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Lovensheimer.

**MUSL 3223. Music in the Age of Beethoven and Schubert.** [Formerly MUSL 223] The musical legacy of each composer in culture and (especially) social context: patrons, family, and friends. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Cyrus, Lowe, Shadle. (Offered alternate years)

**MUSL 3224. Haydn and Mozart.** [Formerly MUSL 224] An in-depth look at the music of Haydn and Mozart in cultural and social contexts. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Lowe.

**MUSL 3225. Brahms and the Anxiety of Influence.** [Formerly MUSL 225] A study of Brahms' large-scale orchestral works and other selected literature from the perspective of 'influence.' Musical relationships to Couperin, JS Bach and sons, Beethoven, Wagner, Schoenberg and others. Topics include Brahms' self-image; Brahms as conductor, performer and editor; stylistic fingerprints; popular and folk elements; Brahms and later composers; his relationship to Clara; the Wagner-Brahms debate. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 2100; or permission of instructor. FALL. [3] Cyrus. (Offered alternate years)

**MUSL 3226. The String Quartet.** [Formerly MUSL 226] An intensive exploration of the string quartet. Topics for discussion include origins and history of the genre, rhetoric, audience, reception, interpretation, and performance practice. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Lowe.

**MUSL 3227. Music in the Age of Revolution, 1789-1848.** [Formerly MUSL 227] Explores developments in genres, styles, patronage, and careers brought on by socioeconomic and political change from late Haydn to Wagner. Topics include nationalism, Romanticism, rise of the middle class, touring virtuoso, composer/critic. Musical analysis, historical and cultural context. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Calico, Shadle.

**MUSL 3228. J. S. Bach: Learned Musician and Virtual Traveler.** [Formerly MUSL 228] Explores the life and works of high baroque composer J. S. Bach, who developed a highly cosmopolitan, erudite



musical style. Course will include structural and stylistic analysis and will also address biography, cultural context, and performance practice. Prerequisite: B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. SPRING. [3] Lowe.

**MUSL 3229. Robert Schumann and the Romantic Sensibility.** [Formerly MUSL 229] An exploration of Robert Schumann's music and criticism within the context of German Romanticism. B.Mus. students and second majors, MUSL 2200W, 2100, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Lovensheimer.

**MUSL 3230. Music and the Construction of National Identity.** [Formerly MUSL 230] Music and the Construction of National Identity. [Formerly MUSL 230] An in-depth exploration of the tools used to construct national musical identities during the long nineteenth century (ca. 1789-1914), including compositional style, performance techniques, and music criticism. Addresses topics from Western Europe, Eastern Europe, and the Americas. Prerequisite: B.Mus. students and second majors: MUSL 2200W, 2100, and 3100; music minors: MUSL 1200 or 2200W; or permission of instructor. SPRING. [3] Shadle.

**MUSL 3231. The Art of Program Music: Tone Painting and Symphonic Poetry.** An in-depth exploration of the style, philosophical basis, and possible meanings of program music, broadly defined. Examples will be taken from the sixteenth century to the present with a focus on the long nineteenth century (1789-1914). Prerequisite: B.Mus. students and second majors: MUSL 2200W, 2100, and 3100; music minors: MUSL 2200W or 1200; or permission of instructor. [3] Shadle.

**MUSL 3810. Academic Research and Writing in Music.** [Formerly MUSL 288] Intensive development of a musicology research project already in progress (such as a term paper, grant proposal, etc.). Focus on research methods in musicology and effective academic writing. Instruction centers on peer review and editing, guided research, and analysis of research, writing, and editing processes. Students will also develop an academic curriculum vita. Projects must be approved by the instructor before students register. Prerequisite: MUSL 2200W or permission of the instructor. May be repeated once for credit. [3] (Not currently offered)

**MUSL 3850. Independent Study.** [Formerly MUSL 289] Development and execution of a program of study in musicology or ethnomusicology under the direction of a member of the department. (See Academic Regulations section.) [Repeatable for credit, variable up to 3 hours per semester.] Musicology faculty.

**MUSL 3890. Selected Topics in Music History.** [Formerly MUSL 294] Selected methodological approaches focused on a particular topic. Offerings have included "Music and the American Presidency," "Schoenberg and the Word," "Mingus, Monk, and Miles: Jazz Biography and Jazz Composition," "Stephen Sondheim and the American Musical," and "Mozart Piano Concertos." Prerequisite: varies by topic. May be repeated for credit when topics vary. [3] Musicology faculty.

**MUSL 4978. Senior Thesis.** [Formerly MUSL 298] Completion of an extended paper based in musicological or ethnomusicological research under the supervision of a faculty sponsor. Progress monitored via tutorials. Open only to seniors. Prerequisite: MUSL 3100. [Variable credit, 1-3 hours each semester; may be repeated once] Musicology faculty.

**MUSL 4998. Senior Honors Thesis.** [Formerly MUSL 299A] Independent research on a musicological or ethnomusicological topic, culminating in a written thesis submitted to the faculty. Progress monitored via tutorials. Students completing this course with distinction, including a thesis and an oral defense, will earn honors or highest honors in music literature and history. Open only to students in the department honors program. Prerequisite: Departmental approval of formal prospectus. [3] Musicology faculty.

**MUSL 4999. Senior Honors Thesis.** [Formerly MUSL 299B] Independent research on a musicological or ethnomusicological topic, culminating in a written thesis submitted to the faculty. Progress monitored via tutorials. Students completing this course with distinction, including a thesis and an oral defense, will earn honors or highest honors in

music literature and history. Open only to students in the department honors program. Prerequisite: Departmental approval of formal prospectus. [3] Musicology faculty.

## MUSO: Other Music Courses

**MUSO 1000. Recital Attendance.** [Formerly MUSO 108] Weekly recitals in solo and chamber music settings, presented by students enrolled for performance instruction, and six additional faculty/student recitals and concerts. Required of all music degree (B. MUS) students. (See Academic Regulations section of catalog.) Offered on a pass/fail basis. This course is repeatable. [0] Melissa Rose.

**MUSO 1001. Commons Seminar.** [Formerly MUSO 099] Open to first-year students of all four undergraduate schools. Topics approved by Blair faculty. Students may propose topics through the associate dean. No credit toward a major or minor in music. General Elective credit only. FALL, SPRING. [1] Staff.

**MUSO 1120. Brass Seminar.** [Formerly MUSO 152] Fundamentals of brass playing; an overview of basic techniques. An in-depth study of non-traditional notation, performance practice, and ensemble rehearsal techniques. Required of all brass performance majors. Open only to music majors. SPRING. [1] Wilson.

**MUSO 1130. Percussion Seminar.** [Formerly MUSO 153] Overview of percussion in Western and non-Western cultures from pre-history to present. Emphasis on European/American orchestral practices. Representative works for study chosen from symphony, opera, oratorio, and other orchestral/choral sources. FALL. [1] Jung.

**MUSO 1201. Lyric Theatre Workshop I.** [Formerly MUSO 104A] Introduction to the various performance elements of the lyric theatre experience: acting, movement, improvisation, use of the voice, stage combat, and scene study. Open to all Vanderbilt students by consent of instructor. SPRING. [1] Shay.

**MUSO 1202. Lyric Theatre Workshop II.** [Formerly MUSO 104B] Various performance elements of the lyric theatre experience: acting, movement, improvisation, use of the voice, stage combat, and scene study. Prerequisite: MUSO 1201. SPRING. [1] Shay.

**MUSO 1203. Lyric Theatre Workshop for Instrumentalists.** [Formerly MUSO 104C] Beginning acting and movement techniques for the lyric stage as they pertain to instrumental musicians. Memorized texts, acting improvisation, and stage movement are explored to gain better connection to the music, fellow collaborators, and the audience. Application to individual instrumental repertoire required. Open by consent of instructor. SPRING. [1] Shay.

**MUSO 1210. Baroque Performance for Strings.** [Formerly MUSO 117] Aspects of period instrument performance adaptable to modern instruments and modern bows. Articulation, ornamentation, the rule of the down-bow, the influence of dance, and other technical and stylistic issues. Baroque bow provided. Culminates in a lecture-performance. May be repeated for credit. [1] (Not currently offered)

**MUSO 1220. Elements of Jazz Improvisation.** [Formerly MUSO 131] Introduction to the techniques of jazz improvisation. Development of basic performing techniques in various styles. Prerequisite: MUKH 1131. May be repeated for credit. FALL, SPRING. [1] Middagh, Spencer.

**MUSO 1300. Music and the Fall of Segregation.** [Formerly MUSO 154] A study of how music, specifically swing and jazz from the 1930s and '40s, rock & roll and rhythm & blues in the 1950s, and soul music in the 1960s, impacted segregation and the Civil Rights Movement. Case studies and personal reflections from the perspective of a studio musician, record producer, and record company executive. Films, recordings, and oral histories of artists and producers. FALL, SPRING. [3] Buckingham. (Not currently offered)

**MUSO 1340. Technology for Musicians.** An introduction to music-related computer technology essential to the contemporary musician, including notation software, recording and editing techniques for audio/video production, and website creation. Prerequisite: Open to B.Mus.

students and declared music minors/second majors. Recommended prerequisite: Completion of MUKH 1131 or equivalent. [1] Salazar.

**MUSO 1350. Computer Recording Technology Seminar.** [Formerly MUSO 102] The digital recording revolution. Recording, editing, and mixing music, using both audio and MIDI sequencing data inside the computer. Remixing techniques with universal plug-in software. Sampling, synthesis, and dissection of studio projects. FALL, SPRING. [2] Wilder. (Not currently offered)

**MUSO 1400. Diction for Singers: English and Italian.** [Formerly MUSO 159] An introduction to the International Phonetic Alphabet as applied to lyric English and Italian diction. FALL. [1] Montgomery.

**MUSO 1410. Diction for Singers: German.** [Formerly MUSO 159C] High German diction, using the International Phonetic Alphabet. Prerequisite: 1400 or permission of the instructor. SPRING. [1] Montgomery.

**MUSO 1420. Diction for Singers: French.** [Formerly MUSO 159D] French stage diction, using the International Phonetic Alphabet. Prerequisite: 1400 or permission of the instructor. FALL. [1] Montgomery.

**MUSO 2100. Music Criticism and Writing.** [Formerly MUSO 200] A practical guide to writing professional music criticism. Readings include selected writings of the great critics, literary authors, program annotators and bloggers. Assignments involve listening exercises, written reviews and program notes. Difference in style among classical, jazz and rock critics will be considered. Prerequisite: MUSL 2200W and MUSL 2100, or permission of instructor. FALL. [2] Pitcher.

**MUSO 2200. The Movement of Line.** By examining in detail inter-related examples from calligraphy, drawing, verse, and music, this course seeks to discover common elements of concept and construction in diverse forms of linear movement. Sophomore standing and an ability to read a single line of music required. [3] Carl Smith.

**MUSO 3000. Collaborative Composition in London.** [Formerly MUSO 230] Exchange program with the Royal Academy of Music, London. Collaborative workshop between student composers and performers at both schools, with faculty mentorship. Travel to London over spring break (vouchers available), hosting of RAM students at Blair the following week. Enrollment by audition. SPRING. [1] Michael Rose and Peter Sheppard Skaerved (RAM). (Not currently offered)

**MUSO 3010. Performance in Practice, IES Vienna.** [Formerly MUSO 231] Open by audition to students in the IES Vienna program. The workshop is designed to offer vocalists and instrumentalists the opportunity to expand repertoire and enhance performance skills. Rehearsal and discussion of aspects of selected works in relation to the challenge of performance. May be repeated once for credit. [2] Staff.

**MUSO 3020. Vanderbilt Music Académie.** [Formerly MUSO 232] Holistic approach to intensive performance study through cultural immersion in residence with Vanderbilt in France in Aix-en-Provence. Large ensemble, chamber music, master classes, private instruction with performances and public coachings each week. Artistic introspection and cultural exploration through French classes, excursions, and activities. SUMMER. [2] Verrier.

**MUSO 3100. Music and Cognition.** Theories and research about the cognition of music, appreciation, and performance. Selected musical topics include timbre, consonance, dissonance, tuning, melody, rhythm, scales, modes, chords, and composition. Concepts and research from the psychological sciences emphasize sensory mechanisms, perceptual discriminations, pattern recognition, categorization, transfer of learning, and motor coordination. Prerequisite: One course in music or psychology. [3]

**MUSO 3850. Independent Study.** [Formerly MUSO 289] Development of a project or a program of reading under the direction of a faculty sponsor. Consent of the faculty sponsor is required. (See Academic Regulations section.) [Repeatable for credit; variable up to 3 hours per semester.] Staff.

**MUSO 3970. Junior Recital.** [Formerly MUSR 295] Students are encouraged to prepare a joint recital, shared with another degree candidate.

See Blair Academic Regulations section of the *Undergraduate Catalog* for detailed requirements. Open by permission of instructor. [1]

**MUSO 4970. Senior Recital.** [Formerly MUSR 299] See Blair Academic Regulations section of the *Undergraduate Catalog* for detailed requirements. Open by permission of instructor. [1]

## MUTH: Music Theory

**MUTH 1120. Songwriting and Elements of Music Theory.** [Formerly MUSC 100] Introduction to fundamental elements of music as they apply to popular songwriting techniques. Selected readings on the technical and aesthetic facets of songwriting. Listening analysis and discussion of songs in a variety of current styles. Selected aural skills as they relate to the songwriter's craft. Class visits by successful songwriters. Designed for students with little or no technical training in music. Does not count toward a major or minor in music. FALL, SPRING. [3] Walker.

**MUTH 1125. Songwriting II.** [Formerly MUSC 102] Project-based class designed to refine and advance skills developed in MUTH 1120. Focuses on effective musical and lyrical thematic treatment. Extensive study of rewriting techniques; frequent performances of student compositions. Selected readings on the technical and aesthetic facets of songwriting. Listening, analysis, and discussion of songs in a variety of current styles. Occasional Monday night sessions with guest songwriters and experts in the field. Does not count toward a major or minor in music. May be repeated once for credit. Prerequisite: MUTH 1120. FALL, SPRING. [3] Walker.

**MUTH 1130. Nashville Number System for Songwriters/Performers.** [Formerly MUSC 104] Designed for songwriters and practitioners who may not read traditional music. Introduction to intervals, major and minor scales, chords and chord extensions, inversions, time signatures, note values, the Nashville Number System, song forms, charting original songs and classic hits. Includes observation and discussion of studio work. Does not count toward major or minor in music. FALL. [1] Blackmon.

**MUTH 1135. Mozart.** [Formerly MUSC 118] The music of Wolfgang Amadeus Mozart. Techniques for listening to different genres of classical music. Emphasis on style and structure, music theory and history, and Mozart's life and character. No musical background assumed. Does not count toward major or minor in music. SPRING. [3] Bingham.

**MUTH 1200. Survey of Music Theory.** [Formerly MUSC 120A] Presents eighteenth- to twentieth-century harmonic practice. Designed to develop music theory skills through written exercises of figured and unfigured basses; harmonization of melodies; and study of ear training, using sight-singing exercises and melodic and harmonic dictation. Not open to students who have completed MUTH 2100 or 2200. Does not count toward a major in music. [3] Bingham.

**MUTH 1210. Survey of Music Theory.** [Formerly MUSC 120B] Presents 18th- to 20th-century harmonic practice. Designed to develop music theory skills through written exercises of figured and unfigured basses; harmonization of melodies; and study of ear training, using sight-singing exercises and melodic and harmonic dictation. Prerequisite: MUTH 1200. Not open to students who have completed MUTH 2100 or 2200. Does not count toward a major in music. [3] Bingham.

**MUTH 2100. The Syntax of Music.** [Formerly MUSC 170] Basic elements of music and notation (including computer notation), introduced through a wide variety of styles. Includes non-tonal and non-Western repertoire. Reinforcement of the elements of MUSC 2100/Musicianship Level I throughout. Corequisite: MUSC 2100. FALL. [2] Deakin, Slayton, Carl Smith.

**MUTH 2200. Harmonic Idioms of the Common Practice Period.** [Formerly MUSC 171] Principles of harmonic progression in the context of music from the common practice period. Includes figured bass realization, harmonization, analysis, composition, contrapuntal idioms, modulation. Prerequisite: B- or above in MUTH 2100; corequisite: MUSC 2200. SPRING. [3] Kurek, Michael Rose, Carl Smith, Slayton.

**MUTH 2300. Repertoire Analysis.** [Formerly MUSC 172] A study of diverse and interrelated harmonic, melodic, rhythmic, and structural aspects of the musical repertoire from the common practice era. Approaches to understanding various historical styles through composition and through analysis and interpretation of representative works from each era. Includes study of invention and fugue. Prerequisite: C- or above in MUTH 2200; corequisite: MUSC 2300. FALL. [3] Michael Rose, Kurek, Link, Slayton.

**MUTH 2400. Musical Expansion: the Twentieth Century to the Present.** [Formerly MUSC 173] Late-Romantic, modernist, and postmodern compositional practices, including freely chromatic and non-functional harmony, ordered and unordered sets, post-tonal formal design, contemporary rhythmic devices, indeterminacy, and quotation. Prerequisite: C- or above in MUTH 2300; corequisite: MUSC 2400. SPRING. [3] Link, Kurek, Michael Rose, Slayton.

**MUTH 3100. Individual Theory Instruction (Elective).** [Formerly MUSC 227] Individual instruction and seminars. Score analysis and style-study composition. Prerequisite: MUTH 2400 and consent of instructor. May be repeated for credit. [Variable credit: 1-3 each semester] Music theory faculty.

**MUTH 3110. Orchestration.** [Formerly MUSC 224] Technical and aesthetic considerations in composing or transcribing for individual orchestral instruments, sections, and full orchestra. Score analysis and composition projects. Prerequisite: B- or above in MUTH 2100. SPRING. [3] Kurek.

**MUTH 3120. Jazz Theory.** [Formerly MUSC 248] An exploration of harmonic syntax, melodic construction, and song forms in jazz. Includes analysis, directed listening, and practice hearing jazz chords and chord progressions. Prerequisite: MUTH 1210, or MUTH 2200/MUSC 2200. Recommended: MUSO 1220. SPRING. [2] Middagh.

**MUTH 3130. Techniques of Choral Composition.** [Formerly MUSC 223] Technical and aesthetic considerations involved in arranging and composing for combinations of voices, from two-part to larger choral ensembles, accompanied and unaccompanied. Score analysis and composition projects. Prerequisite: MUTH 2200 or consent of instructor. SPRING. [3] Carl Smith. (Offered alternate years)

**MUTH 3140. Historical Traditions in Composition and in Performance.** [Formerly MUSC 251] Topical approach to historical performance traditions, 1610-1897, addressed through musical analysis and through study of historical performance styles. Emphasis on application of these interpretive skills to live performance. Prerequisite: MUTH 2200. FALL [3]. Carl Smith.

**MUTH 3150. Early Keyboard Literature.** [Formerly MUSC 255] Keyboard music from the late fifteenth to the early eighteenth century. Compositional techniques and performance practices; study of period instruments; literature for clavichord, harpsichord, organ, and fortepiano. FALL. [2] Carl Smith. (Offered alternate years)

**MUTH 3160. Counterpoint: 16th Century Principles.** [Formerly MUSC 261] Techniques for handling independent musical lines according to sixteenth-century principles. Species counterpoint in two voices, composition in three and four voices, and in non-modal and freely tonal styles, but not high Baroque style. Prerequisite: MUTH 2200. SPRING. [3] Carl Smith. (Offered alternate years)

**MUTH 3170. Techniques of Composing for Media.** Techniques for effective composing for media such as film, television, games, and Internet, including composing with virtual instruments, digital audio mixing and synchronizing to video. Creation of a 5-7 minute original sound track or film composing demo reel. Prerequisite: COMP 1100 or MUTH 2400 or permission of instructor. FALL. [2] Kurek.

**MUTH 3200. Chromatic Harmony in the Romantic Era.** [Formerly MUSC 226] Intensive analysis of challenging standard repertoire by three generations of Romantic composers, whose ingenious extensions of Classic period strategies of tonal organization require interpretive tools beyond the scope of the core theory curriculum. Investigation of both large and small forms. Focus on relationships between harmonic and structural symmetries. Prerequisite: MUTH 2400. [3] Michael Rose. (Offered alternate years)

**MUTH 3210. Post-tonal Analysis.** [Formerly MUSC 225] Exploration of the post-tonal analytical techniques through intensive study of selected works of composers from the early 20th century to the present, including Debussy, Scriabin, Schoenberg, Berg, Webern, Stravinsky, Copland, Dallapiccola, Boulez, Cage, Berio, Feldman, Lachenmann. Prerequisite: MUTH 2400. SPRING. [2] Slayton. (Offered alternate years)

**MUTH 3220. Musical Explorations: Bartók.** [Formerly MUSC 280] In-depth study of the life and music of Béla Bartók; includes detailed investigation of salient theoretical concepts, formal structures, and the composer's integration of various regional folk musics into his own works. Prerequisite: MUTH 2400 or permission of instructor. SPRING [2] Slayton.

**MUTH 3890. Special Topics in Music Theory.** [Formerly MUSC 294] Advanced study in theory, focused on various topics from year to year, including such areas as advanced counterpoint, analysis of a specific composer, Schenkerian analysis, etc. Prerequisite: Varies by topic. [2 or 3, as listed.] Kurek, Link, Michael Rose, Slayton, Carl Smith.

## MWEL: Musicians' Wellness

**MWEL 1120. The Alexander Technique I.** [Formerly MUSO 162A] An accurate kinesthetic sense of the structure and movement of the body through hands-on and verbal instruction in body mapping and the principles developed by F. M. Alexander. Emphasis on ordinary daily activities. Offered on a pass/fail basis only. FALL, SPRING. [1] Ahner.

**MWEL 1121. The Alexander Technique II.** [Formerly MUSO 162B] Further exploration of the principles of the technique applied to daily activities and developmental movement. Emphasis on individual experiences within the context of the class. Offered on a pass/fail basis only. Prerequisite: MWEL 1120. FALL, SPRING. [1] Ahner.

**MWEL 1130. Meditation for Musicians.** [Formerly MUSO 164] A practice-centered approach helps students develop a regular meditation routine. Each weekly session involves meditation, in-class reading, listening, and performance. Prerequisite: Open to music majors and minors. Offered on a pass/fail basis. FALL, SPRING. [1] Joshua McGuire.

**MWEL 1140. Tai Chi for Musicians.** [Formerly MUSO 165] Principles of Tai Chi applied to musical performance. The practice and understanding of anatomical movement, with emphasis on prevention of injury. Offered on a pass/fail basis. FALL, SPRING. [1] Phillips.

**MWEL 2120. The Performer and the Body.** [Formerly MUSO 163] Application of the Alexander technique in a small group setting with attention to individuals and their particular performance modes, i.e., public speaking, singing, dancing, acting, playing an instrument. Offered on a pass/fail basis. May be repeated once for credit. Prerequisite: MWEL 1120. FALL, SPRING. [1] Ahner.

## Group Performance Instruction

**FDDL 1010. Introduction to Fiddle I.** [Formerly MUSP 107A] Designed for those with no experience in fiddle playing. Technical, stylistic, and historical elements involved in fiddling, as well as basic notation and idiomatic techniques. Fees apply to non-B.Mus. students. [1] Combs, Plohman.

**GTR 1010. Introduction to Guitar I.** [Formerly MUSP 104A] A foundation in basic guitar technique that will prepare students for future studies in classical, jazz, or popular styles of guitar. Emphasis on chordal accompaniment, development of reading skills, improvisational techniques with melodies and chords. One 50-minute group lesson weekly. Fees apply to non-B.Mus. students. [1] Phillips.

**GTR 1020. Introduction to Guitar II.** [Formerly MUSP 104B] A foundation in basic guitar technique that will prepare students for future studies in classical, jazz, or popular styles of guitar. Emphasis on chordal accompaniment, development of reading skills, improvisational techniques with melodies and chords. One 50-minute group lesson weekly.

Prerequisite: GTR 1010 or permission of instructor. Fees apply to non-B.Mus. students. [1] Phillips.

**PERC 1010. Introduction to Percussion.** [Formerly MUSP 105A] Basic percussion techniques with emphasis on rolls, embellishments, sticking combinations, and their applications for concert and popular musical styles. Prerequisite: previous musical experience and an understanding of notation. One 50-minute group lesson weekly. Fees apply to non-B.Mus. students. [1] Wiggins.

**PIAN 1010. Introduction to Piano I.** [Formerly MUSP 102A] A total-musicianship approach to the piano. Repertoire, technique, and sight reading are studied. Also includes the study of transposition, harmonization, and improvisation. One 50-minute group lesson weekly. Fees apply. Not open to B.Mus. students. FALL, SPRING. [1] Wade.

**PIAN 1020. Introduction to Piano II.** [Formerly MUSP 102B] A total-musicianship approach to the piano. Repertoire, technique, and sight reading are studied. Also includes the study of transposition, harmonization, and improvisation. One 50-minute group lesson weekly. Prerequisite: PIAN 1010 or permission of instructor. Fees apply. Not open to B.Mus. students. FALL, SPRING. [1] Wade.

**STPN 1010. Introduction to Steel Pan/Drum.** [Formerly MUSP 109A] Designed for those with no experience in playing steel pan/drum. A foundation of basic techniques, Caribbean song styles (Calypso, Soca, Reggae), history and development of the steel band art form, and cultural awareness. One 60-minute group lesson weekly. Fees apply to non-B.Mus. students. FALL, SPRING, SUMMER. [1] Britain.

**VLA 1010. Viola for Violinists.** [Formerly MUSO 116] Technical principles, practices, and strategies for violinists learning viola. Investigation of solo and chamber music repertoire; historical evolution of the viola. Viola provided. Prerequisite: Approval of violin instructor and course instructor. FALL, SPRING. [1] Plummer.

## Individual Performance Instruction

Courses are repeatable. Students may accrue up to 4 credit hours per semester of enrollment.

**BASS 1100. Double Bass (Elective/Minor/Second Major).** [Formerly MUSP 185] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Meyer, Reist, Wanner.

**BASS 2100. Double Bass (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 185] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Meyer, Reist, Wanner.

**BASS 2200. Double Bass (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 185] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Meyer, Reist, Wanner.

**BASS 4100. Double Bass (Musical Arts Juniors/Seniors).** [Formerly MUSP 285] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Meyer, Reist, Wanner.

**BASS 4200. Double Bass (Performance Majors Juniors/Seniors).** [Formerly MUSR 285] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Meyer, Reist, Wanner.

**BANJO 1100. Banjo.** [Formerly MUSP 197] Individual instruction focused on the art and practice of the instrument, with emphasis on

tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. New students by interview only. Fees apply to non-B.Mus. students [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Brown.

**BSSN 1100. Bassoon (Elective/Minor/Second Major).** [Formerly MUSP 175] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Kolkay.

**BSSN 2100. Bassoon (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 175] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Kolkay.

**BSSN 2200. Bassoon (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 175] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Kolkay.

**BSSN 4100. Bassoon (Musical Arts Juniors/Seniors).** [Formerly MUSP 275] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Kolkay.

**BSSN 4200. Bassoon (Performance Majors Juniors/Seniors).** [Formerly MUSR 275] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Kolkay.

**CLAR 1100. Clarinet (Elective/Minor/Second Major).** [Formerly MUSP 173] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Jackson, Lee.

**CLAR 2100. Clarinet (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 173] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Jackson.

**CLAR 2200. Clarinet (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 173] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Jackson.

**CLAR 4100. Clarinet (Musical Arts Juniors/Seniors).** [Formerly MUSP 273] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Jackson.

**CLAR 4200. Clarinet (Performance Majors Juniors/Seniors).** [Formerly MUSR 273] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jackson.

**CLLO 1100. Cello (elective credit and General Music Minors).** [Formerly MUSP 184] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Cassel, Mansell, Wang.

**CLLO 2100. Cello (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 184] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Wang.

**CLLO 2200. Cello (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 184] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Wang.

**CLLO 4100. Cello (Musical Arts Juniors/Seniors).** [Formerly MUSP 284] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Wang.

**CLLO 4200. Cello (Performance Majors Juniors/Seniors).** [Formerly MUSR 284] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Wang.

**DLCM 1100. Dulcimer.** [Formerly MUSP 194] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Rowe.

**DRUM 1100. Drumset (elective credit).** [Formerly MUSP 180A] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] D. Phillips.

**EUPH 1100. Euphonium (Elective/Minor/Second Major).** [Formerly MUSP 190] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Long.

**EUPH 2100. Euphonium (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 190] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Long.

**EUPH 2200. Euphonium (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 190] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Long.

**EUPH 4100. Euphonium (Musical Arts Juniors/Seniors).** [Formerly MUSP 290] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Long.

**EUPH 4200. Euphonium (Performance Majors Juniors/Seniors).** [Formerly MUSR 290] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Long.

**FDDL 1100. Fiddle.** [Formerly MUSP 192] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Combs, Plohman.

**FLUT 1100. Flute (elective/music minors/2nd majors).** [Formerly MUSP 171] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Dikeman.

**FLUT 2100. Flute (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 171] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Dikeman.

**FLUT 2200. Flute (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 171] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Dikeman.

**FLUT 4100. Flute (Musical Arts Juniors/Seniors).** [Formerly MUSP 271] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Dikeman.

**FLUT 4200. Flute (Performance Majors Juniors/Seniors).** [Formerly MUSR 271] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Dikeman.

**GTR 1030. Fingerboard Harmony.** [Formerly MUSO 114] Individual instruction in advanced guitar skills: modal positions, modal patterns, score reading, arpeggios, transposition, and chord progressions. Fees apply to non-B.Mus. students. Prerequisite: GTR 1020 or permission of instructor. FALL, SPRING. [1-2 variable hours, based on lesson length as agreed on with instructor.] J. Phillips.

**GTR 1100. Guitar (Elective/Minor/Second Major).** [Formerly MUSP 188] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Todd, J. Phillips.

**GTR 2100. Guitar (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 188] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Todd.

**GTR 2200. Guitar (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 188] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Todd.

**GTR 4100. Guitar (Musical Arts Juniors/Seniors).** [Formerly MUSP 288] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Todd.

**GTR 4200. Guitar (Performance Majors Juniors/Seniors).** [Formerly MUSR 288] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Todd.

**HARP 1100. Harp (Elective/Minor/Second Major).** [Formerly MUSP 181] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Jaskunas.

**HARP 2100. Harp (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 181] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Jaskunas.

**HARP 2200. Harp (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 181] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Jaskunas.

**HARP 4100. Harp (Musical Arts Juniors/Seniors).** [Formerly MUSP 281] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Jaskunas.

**HARP 4200. Harp (Performance Majors Juniors/Seniors).** [Formerly MUSR 281] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jaskunas.

**HORN 1100. Horn (Elective/Minor/Second Major).** [Formerly MUSP 176] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Norton.

**HORN 2100. Horn (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 176] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Norton.

**HORN 2200. Horn (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 176] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Norton.

**HORN 4100. Horn (Musical Arts Juniors/Seniors).** [Formerly MUSP 276] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Norton.

**HORN 4200. Horn (Performance Majors Juniors/Seniors).** [Formerly MUSR 276] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Norton.

**HRPS 1100. Harpsichord.** [Formerly MUSP 193] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor]. Brecht, Carl Smith.

**JAZZ 1100. Jazz Private Instruction.** [Formerly MUSO 133] Private instruction on standard jazz instruments and voice. Repertory and techniques chosen to meet individual needs. Open by audition. Private lesson fees apply to non-B.Mus. students. May be repeated for credit. Prerequisite: 131 or 132. FALL, SPRING. [Variable credit: 1-2 each semester. Multiple section enrollment possible. Students may accrue up to 6 credit hours per semester of enrollment]. Coffin, Dudley, Kimbrough, D. Phillips, Spencer, Watson.

**JAZZ 1150. Jazz and Commercial Arranging.** Individual instruction in jazz and commercial arranging, content ranging from lead sheet writing to studio orchestra. Repertory and techniques chosen to meet individual needs. [1-2] Middagh.

**MNDL 1100. Mandolin.** [Formerly MUSP 195] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Pearcy.

**OBOE 1100. Oboe (Elective/Minor/Second Major).** [Formerly MUSP 172] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Hauser, Wiesmeyer.

**OBOE 2100. Oboe (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 172] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Hauser.

**OBOE 2200. Oboe (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 172] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Hauser.

**OBOE 4100. Oboe (Musical Arts Juniors/Seniors).** [Formerly MUSP 272] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Hauser.

**OBOE 4200. Oboe (Performance Majors Juniors/Seniors).** [Formerly MUSR 272] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Hauser.

**ORGN 1100. Organ (Elective/Minor/Second Major).** [Formerly MUSP 187] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Brecht, Carl Smith.

**ORGN 2100. Organ (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 187] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Carl Smith.

**ORGN 2200. Organ (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 187L] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Carl Smith.

**ORGN 4100. Organ (Musical Arts Juniors/Seniors).** [Formerly MUSP 287] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Carl Smith.

**ORGN 4200. Organ (Performance Majors Juniors/Seniors).** [Formerly MUSR 287] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Carl Smith.

**PERC 1100. Percussion (Elective/Minor/Second Major).** [Formerly MUSP 180] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Jung, Wiggins.

**PERC 2100. Percussion (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 180] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus musical arts majors. [2] Jung.

**PERC 2200. Percussion (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 180] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Jung.

**PERC 4100. Percussion (Musical Arts Juniors/Seniors).** [Formerly MUSP 280] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Specialized study in drumset, jazz vibraphone or contemporary marimba is available. Open only to Musical Arts juniors and seniors; and for elective credit to Percussion Performance juniors and seniors. [2] Jung.

**PERC 4200. Percussion (Performance Majors Juniors/Seniors).** [Formerly MUSR 280] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Specialized study in drumset, jazz vibraphone or contemporary marimba is available. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jung.

**PIAN 1100. Piano (Elective/Minor/Second Major).** [Formerly MUSP 186] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Conner, Coplan, Dorfman, Hwang, Krieger, Middleton, Nies, Reagan, Wade, Walker.

**PIAN 2100. Piano (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 186] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Dorfman, Krieger, Nies.

**PIAN 2200. Piano (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 186] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Dorfman, Krieger, Nies.

**PIAN 4100. Piano (Musical Arts Juniors/Seniors).** [Formerly MUSP 286] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Dorfman, Krieger, Nies.

**PIAN 4200. Piano (Performance Majors Juniors/Seniors).** [Formerly MUSR 286] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Dorfman, Krieger, Nies.

**RCRD 1100. Recorder (elective credit).** [Formerly MUSP 196] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] (Not currently offered)

**SAX 1100. Saxophone (Elective/Minor/Second Major).** [Formerly MUSP 174] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Utley.

**SAX 2100. Saxophone (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 174] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Utley.

**SAX 2200. Saxophone (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 174] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Utley.

**SAX 4100. Saxophone (Musical Arts Juniors/Seniors).** [Formerly MUSP 274] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Utley.

**SAX 4200. Saxophone (Performance Majors Juniors/Seniors).** [Formerly MUSR 274] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Utley.

**STPN 1100. Steel Drum.** [Formerly MUSP 198] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Britain.

**TROM 1100. Trombone (Elective/Minor/Second Major).** [Formerly MUSP 178] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Wilson.

**TROM 2100. Trombone (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 178] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Wilson.

**TROM 2200. Trombone (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 178] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Wilson.

**TROM 4100. Trombone (Musical Arts Juniors/Seniors).** [Formerly MUSP 278] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Wilson.

**TROM 4200. Trombone (Performance Majors Juniors/Seniors).** [Formerly MUSR 278] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Wilson.

**TRPT 1100. Trumpet (Elective/Minor/Second Major).** [Formerly MUSP 177] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Sibaja, Kunkee.

**TRPT 2100. Trumpet (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 177] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Sibaja.

**TRPT 2200. Trumpet (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 177] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Sibaja.

**TRPT 4100. Trumpet (Musical Arts Juniors/Seniors).** [Formerly MUSP 277] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Sibaja.

**TRPT 4200. Trumpet (Performance Majors Juniors/Seniors).** [Formerly MUSR 277] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Sibaja.

**TUBA 1100. Tuba (Elective/Minor/Second Major).** [Formerly MUSP 179] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Long.

**TUBA 2100. Tuba (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 179] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Long.

**TUBA 2200. Tuba (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 179] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Long.

**TUBA 4100. Tuba (Musical Arts Juniors/Seniors).** [Formerly MUSP 279] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Long.

**TUBA 4200. Tuba (Performance Majors Juniors/Seniors).** [Formerly MUSR 279] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Long.

**VLA 1100. Viola (Elective/Minor/Second Major).** [Formerly MUSP 183] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Reinker.

**VLA 2100. Viola (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 183] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Kochanowski, Plummer.

**VLA 2200. Viola (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 183] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Kochanowski, Plummer.

**VLA 4100. Viola (Musical Arts Juniors/Seniors).** [Formerly MUSP 283] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Kochanowski, Plummer.

**VLA 4200. Viola (Performance Majors Juniors/Seniors).** [Formerly MUSR 283] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance

majors. Prerequisite: Successful completion of upper divisional hearing. [4] Kochanowski, Plummer.

**VLN 1100. Violin (Elective/Minor/Second Major).** [Formerly MUSP 182] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Blackwell, S. Chang, W. Chang, Heard, Huebl, McGann, Miahky.

**VLN 2100. Violin (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 182] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Heard, Huebl, Miahky.

**VLN 2200. Violin (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 182] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Heard, Huebl, Miahky.

**VLN 4100. Violin (Musical Arts Juniors/Seniors).** [Formerly MUSP 282] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Heard, Huebl, Miahky.

**VLN 4200. Violin (Performance Majors Juniors/Seniors).** [Formerly MUSR 282] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Heard, Huebl, Miahky.

**VOIC 1100. Voice (Elective/Minor/Second Major).** [Formerly MUSP 189] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus. students. [1-2 variable credit hours, based on lesson length and repertoire as agreed on with instructor] Montgomery, Prentice.

**VOIC 2100. Voice (Musical Arts Freshmen/Sophomores).** [Formerly MUSP 189] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. musical arts majors. [2] Jarman, Nelson, Shay.

**VOIC 2200. Voice (Performance Majors Freshmen/Sophomores).** [Formerly MUSR 189] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [3] Jarman, Nelson, Shay.

**VOIC 4100. Voice (Musical Arts Juniors/Seniors).** [Formerly MUSP 289] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to Musical Arts juniors and seniors. [2] Jarman, Nelson, Shay.

**VOIC 4200. Voice (Performance Majors Juniors/Seniors).** [Formerly MUSR 289] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jarman, Nelson, Shay.



## Performance Classes

All courses are repeatable.

**BASS 1000. Bass Performance Class.** [Formerly MUSO 109L] Weekly observation and participation. Required of all bass majors, performance and musical arts. Offered on a pass/fail basis. [0] Reist, Wanner.

**BSSN 1000. Bassoon Performance Class.** [Formerly MUSO 110E] Weekly observation and participation. Required of all bassoon majors, performance and musical arts. Offered on a pass/fail basis. [0] Kolkay.

**CLAR 1000. Clarinet Performance Class.** [Formerly MUSO 110F] Weekly observation and participation. Required of all clarinet majors, performance and musical arts. Offered on a pass/fail basis. [0] Jackson.

**CLLO 1000. Cello Performance Class.** [Formerly MUSO 109C] Weekly observation and participation. Required of all cello majors, performance and musical arts. Offered on a pass/fail basis. [0] Wang.

**FLUT 1000. Flute Performance Class.** [Formerly MUSO 109A] Weekly observation and participation. Required of all flute majors, performance and musical arts. Offered on a pass/fail basis. [0] Dikeman.

**GTR 1000. Guitar Performance Class.** [Formerly MUSO 109E] Weekly observation and participation. Required of all guitar majors, performance and musical arts. Offered on a pass/fail basis. [0] Todd, J. Phillips.

**HORN 1000. Horn Performance Class.** [Formerly MUSO 111A] Weekly observation and participation. Required of horn majors, performance and musical arts. Offered on a pass/fail basis. [0] Norton.

**OBOE 1000. Oboe Performance Class.** [Formerly MUSO 110D] Weekly observation and participation. Required of all oboe majors, performance and musical arts. Offered on a pass/fail basis. [0] Hauser.

**PERC 1000. Percussion Performance Class.** [Formerly MUSO 110G] Weekly observation and participation. Required of all percussion majors, performance and musical arts. Offered on a pass/fail basis. [0] Jung.

**PIAN 1000. Piano Performance Class.** [Formerly MUSO 109D] Weekly observation and participation. Required of all piano majors, performance and musical arts. Offered on a pass/fail basis. [0] Dorfman, Krieger, Nies.

**SAX 1000. Saxophone Performance Class.** [Formerly MUSO 110L] Weekly observation and participation. Required of saxophone majors, performance and musical arts. Offered on a pass/fail basis. [0] Utley.

**TROM 1000. Trombone Performance Class.** [Formerly MUSO 111B] Weekly observation and participation. Required of all trombone majors, performance and musical arts. Offered on a pass/fail basis. [0] Wilson.

**TRPT 1000. Trumpet Performance Class.** [Formerly MUSO 110A] Weekly observation and participation. Required of all trumpet and horn majors, performance and musical arts. Offered on a pass/fail basis. [0] Sibaja.

**TUBA 1000. Low Brass Performance Class.** [Formerly MUSO 110B] Weekly observation and participation. Required of all euphonium and tuba majors, performance and musical arts. Offered on a pass/fail basis. [0] Long.

**VLA 1000. Viola Performance Class.** [Formerly MUSO 109G] Weekly observation and participation. Required of all viola majors, performance and musical arts. Offered on a pass/fail basis. [0] Kochanowski, Plummer.

**VLN 1000. Violin Performance/Studio Class.** [Formerly MUSO 109B] Weekly observation and participation. Required of all violin majors, performance and musical arts. Offered on a pass/fail basis. [0] Heard, Huebl, and Miahky.

**VOIC 1000. Voice Performance Class.** [Formerly MUSO 109F] Weekly observation and participation. Required of all voice majors, performance and musical arts. Offered on a pass/fail basis. [0] Jarman, Nelson, Shay.

# Blair School of Music

MARK WAIT, D.M.A., Dean  
 MELISSA K. ROSE, D.M.A., Associate Dean, Collegiate Program  
 PAMELA SCHNELLER, M.C.M., Associate Dean, Precollege and Adult Program  
 THOMAS CRESPO, M.M., Director, Admissions  
 MOLLY JEWELL, B.M., Assistant Director, Admissions  
 ROBERT HALLIBURTON, B.S., C.P.A., Business Officer  
 JOSEPH DEBUSK, Director of Technical Operations  
 THOMAS LANGMESSER, B.A., Academic Services Assistant  
 VIRGINIA PAYNE, B.A., Associate Dean for Blair Development and Alumni Relations  
 KRISTIN WHITTLESEY, B.A., Director of External Relations

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 SARA J. MANUS, M.L.S., Music Librarian for Public Services  
 JACOB SCHAUB, M.M., M.L.S., Music Librarian/Cataloging

## Department Chairs

JEREMY WILSON, Brass and Percussion  
 CONNIE HEARD, Strings, Guitar, and Harp  
 PETER KOLKAY, Woodwinds  
 JIM LOVENSHEIMER, Music Literature/History  
 AMY K. JARMAN, Voice  
 MARIANNE PLOGER, Musicianship  
 MICHAEL SLAYTON, Composition/Theory  
 KAREN ANN KRIEGER and HEATHER CONNER, Keyboard Co-Chairs

## Faculty Coordinators

TUCKER BIDDLECOMBE, Teacher Education Program  
 ROBIN FOUNTAIN, Ensembles  
 MICHAEL HIME and JAMA REAGAN, Music Minors  
 CHI-HEE HWANG, Precollege Group Piano  
 BRIAN UTLEY, Chamber Music  
 RYAN MIDDAGH, Jazz Studies  
 CRYSTAL PLOHMAN, Folk Instruments  
 PAMELA SCHNELLER, Precollege Scholarships  
 CARL F. SMITH, JR., Music as a Second Major  
 CAROL F. SMITH, Suzuki Program

## Committees of the School

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BMI COMPOSER-IN-RESIDENCE. Michael Kurek, Chair. Robin Fountain, Bil Jackson, Stan Link, Tom Verrier.

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CONCERTS. Kristin Whittlesey, Chair. Tucker Biddlecombe, Bil Jackson, Ji Hye Jung, Joshua McGuire, Stephen Miahky, Ryan Middagh, Pamela Schneller.

CURRICULUM. Joshua McGuire, Chair. Philip Dikeman, Robbie Fry, Connie Heard, Amy Jarman, Melissa Rose, Michael Slayton.

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FACULTY ADVISORY COUNCIL. Tucker Biddlecombe, Ben Harris, Brian Utley

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FACULTY SENATE. Gayle Shay, Jeremy Wilson. Ex Officio: Mark Wait.

INTERNATIONAL STUDIES. Joy Calico, Melissa Rose.

MA5 ADVISORY. Tucker Biddlecombe, Chair. David Cassel, Ryan Middagh, Erin Charles Perez, Joe Rea Phillips, Pamela Schneller, Jeremy Wilson.

MUSIC LIBRARY. Jama Reagan, Chair. ChiHee Hwang, Melanie Lowe, Jennifer McGuire, Michael Rose, Holling Smith-Borne.

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PRECOLLEGE CERTIFICATE PROGRAM COUNCIL. Kirsten Cassel-Greer, Chair. Heather Conner, Paul Deakin, Carolyn Huebl, Jama Reagan, Pamela Schneller, Roland Schneller, Brian Utley.

PRECOLLEGIATE ENSEMBLE DIRECTORS. Pamela Schneller, Chair. Mary Biddlecombe, Carol Nies, Carol Smith.

STUDENT SHOWCASE. Philip Dikeman, Chair. Amy Dorfman, Stephen Miahky, Ryan Middagh, Gayle Shay, Jose Sibaja.

TENURE REVIEW. Gregory Barz and Robin Fountain, Co-Chairs. Joy Calico, Cynthia Cyrus, Amy Dorfman, Connie Heard, Carolyn Huebl, Douglas Lee, Kathryn Plummer, Felix Wang.

WRITING PORTFOLIO ASSESSMENT. Marianne Ploger, Chair. Melanie Lowe, Douglas Shadle.

## Faculty

- OKYEREMA G. AHIMA, Adjunct Instructor in Music  
[2005]
- SALLY R. AHNER, Lecturer in Music  
B.A. (Salem College 1970); M.A. (Eastman 1974) [2005]
- AMY A. ALLEY, Adjunct Artist Teacher of Kindermusik; Adjunct Lecturer in Teacher Education  
B.M. (Tennessee 1977); M.M. (Peabody 1978) [2001]
- MARTHA BARTLES, Adjunct Senior Artist Teacher of Piano  
B.M. (Mississippi 1953); M.F.A. (Ohio 1954) [1997]
- MARY BIDDLECOMBE, Adjunct Artist Teacher of Chorus  
B.M.Ed. (SUNY, Potsdam 1999); M.M. (Florida State 2005) [2012]
- TUCKER BIDDLECOMBE, Associate Professor of Choral Activities and Choral Director  
B.M. (SUNY, Potsdam 1998); M.M., Ph.D. (Florida State 2003, 2012) [2012]
- EMELYNE M. BINGHAM, Senior Lecturer in the Teaching of Music  
B.S. (Tennessee Technological 1983); M.M. (Indiana 1986) [1986]
- CHARLES BLACKMON, Lecturer in Music  
B.A. (Middle Tennessee State 1996) [2010]
- JESSICA BLACKWELL, Adjunct Artist Teacher of Violin  
B.M. (Rice 2006); M.M. (Johns Hopkins 2008) [2009]
- POLLY P. BRECHT, Adjunct Artist Teacher of Accompanying  
B.M., M.M. (Indiana 1979, 1980); D.M. (Florida State 1986) [1996]
- MAT BRITAIN, Adjunct Instructor in Music  
B.M.Ed. (Wichita State 1985) [2004]
- ALISON BROWN, Adjunct Artist Teacher of Banjo  
A.B. (Harvard 1984); M.B.A. (California, Los Angeles 1986) [2010]
- JOY H. CALICO, Professor of Musicology  
B.M. (Baylor 1988); M.M. (Illinois 1992); Ph.D. (Duke 1999) [2003]
- DAVID C. CASSEL, Adjunct Associate Professor of Music  
B.M. (Bowling Green State 1967); M.M., D.M. (Indiana 1968, 1977) [1981]
- SEANAD CHANG, Adjunct Artist Teacher of Violin/Viola  
B.M. (Indiana 1988); M.M. (North Carolina School of the Arts 1991) [2006]
- WEI TSUN CHANG, Adjunct Associate Professor of Violin  
B.M. (Indiana 1988); M.M. (North Carolina School of the Arts 1991); D.M.A. (Michigan State 2006) [2006]
- DALE COCKRELL, Professor of Musicology, Emeritus  
B.M., M.M., Ph.D. (Illinois 1971, 1973, 1978) [1996]
- JEFF COFFIN, Adjunct Instructor in Jazz Saxophone  
B.A. (North Texas 1990) [2015]
- MATT COMBS, Adjunct Instructor in Fiddling and Violin and Director of the Fiddling Program  
B.M. (Michigan 1997) [2004]
- HEATHER CONNER, Senior Artist Teacher of Piano  
B.Mus. (Curtis Institute of Music 1997); M.M. (Yale 1999); D.M.A. (Manhattan School of Music 2006) [2015]
- PETER COOPER, Senior Lecturer in Music History and Literature  
B.A. (Wofford 1993) [2008]
- LAUREN JACKSON COPLAN, Adjunct Artist Teacher of Piano  
B.M. (Boston University 1991) [2011]
- ELIZABETH F. CORMIER, Senior Artist Teacher of Piano, Emerita  
A.B. (Smith 1947); B.M. (New England Conservatory 1950); M.A. (Columbia 1955) [1967]
- ALLAN E. COX, Professor of Trumpet, Emeritus  
B.M.Ed. (Nebraska 1968); M.M. (Wichita State 1970) [1998]
- CYNTHIA J. CYRUS, Vice Provost for Learning and Residential Affairs; Professor of Musicology  
B.A. (Pomona 1984); M.A., Ph.D. (North Carolina 1987, 1990) [1994]
- GARNETT R. DAVIS, Adjunct Assistant Professor of Tuba  
B.S. (North Alabama 1968); M.M. (Indiana 1974) [1992]
- PAUL DEAKIN, Senior Lecturer in Music Theory  
B.A., Ph.D. (Birmingham [U.K.] 1990, 2002) [2004]
- PHILIP DIKEMAN, Associate Professor of Flute  
B.M. (Oberlin 1985); M.M. (Yale 1987) [2011]
- AMY R. DORFMAN, Professor of Piano  
B.M., Performer's Certificate, M.M. (Indiana 1977, 1978, 1981) [1984]
- BRUCE DUDLEY, Adjunct Instructor in Jazz Piano  
B.S. (New York 1984); M.M. (Eastman 1986); D.M.A. (Colorado 2010) [2005]
- CYNTHIA F. ESTILL, Senior Artist Teacher of Bassoon  
B.M. (Indiana 1971); M.M. (Peabody 1975) [1972]
- ROBIN P. FOUNTAIN, Professor of Conducting; Director of the Vanderbilt Orchestra  
B.A., M.A. (Oxford [U.K.] 1981, 1982); M.F.A. (Carnegie Mellon 1986) [1994]
- ROBERT WEBB FRY II, Senior Lecturer in Music History and Literature  
B.M.Ed. (Henderson State 1998); M.M. (Ohio State 2004); Ph.D. (Florida State 2010) [2007]
- MEGAN GALE, Adjunct Artist Teacher of Accompanying  
B.M. (Oberlin 1998); M.M. (Southern California 2000); D.M.A. (Colorado 2007) [2012]
- KIRSTEN CASSEL GREER, Senior Artist Teacher of Suzuki Cello  
B.M. (South Carolina 2002); M.M. (Eastman 2005) [2006]
- JENNIFER GUNDERMAN, Assistant Professor of Musicology  
B.A. (Vassar 1992); M.A. (University of Washington 1996) [2006]
- ERIN HALL, Adjunct Artist Teacher of Violin  
B.M. (Juilliard 1996); M.M. (Cleveland Institute of Music 1998) [2003]
- BEN HARRIS, Senior Lecturer in Music  
B.M. (Oklahoma Baptist 2000); M.M. (Baylor 2002) [2012]
- JARED HAUSER, Associate Professor of Oboe  
B.M. (Michigan 1994); Artist's Diploma (Ohio State 1997); M.M. (Rice 1999); D.M.A. (Michigan State 2013) [2008]
- CORNELIA L. HEARD, Valere Blair Potter Chair; Professor of Violin  
B.M., M.M. (Juilliard 1978, 1979); B.A. (Sarah Lawrence 1980) [1982]
- MARY ANN HEWLETT, Adjunct Artist Teacher of Voice  
B.M. (Vanderbilt 2010); M.M. (Rider 2013) [2016]
- MICHAEL S. HIME, Senior Lecturer in Music Literature  
B.A., M.M. (Peabody 1973, 1977) [1986]
- CAROLYN HUEBL, Professor of Violin  
B.M., M.M. (Cleveland Institute of Music 1992, 1994); D.M.A. (Michigan 1998) [2001]
- CHI-HEE HWANG, Senior Artist Teacher of Piano  
B.M. (Hanyang University [Korea] 2000); M.M. (Tennessee 2004) [2005]
- JUN IWASAKI, Adjunct Professor of Violin  
B.M., M.M. (Cleveland Institute of Music 2004, 2006) [2011]
- BIL JACKSON, Associate Professor of Clarinet  
[2011]
- AMY K. JARMAN, Senior Lecturer in Voice  
B.A. (Evansville 1978); Performance Diploma (Royal College of Music [England] 1990) [1986]
- LICIA JASKUNAS, Adjunct Artist Teacher of Harp  
B.Mus. (Indiana 1989); M.M. (Eastman 1990) [2016]
- JOHN F. JOHNS, Associate Professor of Guitar  
B.M. (Johns Hopkins 1970); M.S. (Peabody 1979) [1980]
- SARA JOHNSON, Adjunct Artist Teacher of Suzuki Violin  
B.S. (North Carolina, Greensboro 1974); M.F.A. (Iowa State 1977) [1997]
- Jl HYE JUNG, Associate Professor of Percussion  
B.M. (Johns Hopkins 2007); M.M. (Yale 2009) [2015]
- ENID KATAHN, Professor of Piano, Emerita  
B.M. (Hartford 1955); M.M. (Peabody 1970) [1977]
- JEROME J. KIMBROUGH, Adjunct Associate Professor of Guitar  
B.M. (Miami 1982) [2006]
- JANE B. KIRCHNER, Associate Professor of Flute, Emerita  
B.M.E., M.M.E., Ed.S. (Peabody 1966, 1967, 1968) [1966]
- JOHN KOCHANOWSKI, Associate Professor of Viola  
[1987]
- PETER KOLKAY, Associate Professor of Bassoon  
B.M. (Lawrence 1998); M.M. (Eastman 2000); M.M.A., D.M.A. (Yale 2002, 2005) [2012]
- MITCHELL KORN, Adjunct Professor of Music and Educational Outreach  
B.A. (Bard [New York] 1974); M.A. (Columbia 1984) [2009]
- SHEREE KOUTSOUKOS, Adjunct Artist Teacher of Piano  
B.A. (Wartburg College 1996); M.M. (Notre Dame 1998) [2002]
- KAREN A. KRIEGER, Associate Professor of Piano  
B.Mus. (Western Illinois 1976); M.M. (Illinois 1978) [1988]

- PATRICK KUNKEE, Adjunct Associate Professor of Trumpet  
B.M. (California State, Northridge 1987); M.M. (Southern California 1989) [1991]
- MICHAEL H. KUREK, Associate Professor of Composition  
B.M. (Tennessee 1977); M.M., A.Mus.D. (Michigan 1981, 1985) [1988]
- ZADA LAW, Adjunct Artist Teacher of Dulcimer  
B.M. (Indiana, Bloomington 1976); M.A. (Wisconsin 1980) [2006]
- CASSANDRA D. LEE, Senior Artist Teacher of Clarinet  
B.S. (Tennessee 1975); M.M. (Northwestern 1979) [1981]
- DOUGLAS A. LEE, Professor of Musicology, Emeritus  
B.M. (DePauw 1954); M.M., Ph.D. (Michigan 1958, 1968) [1986]
- STANLEY B. LINK, Associate Professor of the Philosophy and Analysis of Music  
B.M. (Oberlin 1986); M.F.A., Ph.D. (Princeton 1992, 1995) [1999]
- GILBERT A. LONG, Adjunct Associate Professor of Tuba  
B.M.A. (Louisville 1975) [1995]
- JAMES LOVENSHEIMER, Associate Professor of Musicology  
B.M. (Tennessee 1994); M.A., Ph.D. (Ohio State 1997, 2002) [2002]
- MELANIE LOWE, Associate Professor of Musicology  
B.A. (Smith 1990); M.F.A., Ph.D. (Princeton 1992, 1998) [1998]
- CRAIG MADOLE, Adjunct Artist Teacher of Orchestra  
B.M. (Belmont 2007) [2012]
- BRADLEY D. MANSELL, Adjunct Artist Teacher of Cello  
B.M. (Youngstown State 1982); M.M. (Cincinnati 1984) [1990]
- MAUREEN MAY, Adjunct Instructor in Piano  
B.M., M.M. (Belmont 1994, 2004) [2008]
- CHRISTINA MCGANN, Adjunct Artist Teacher of Violin  
B.M., M.M. (Juilliard 2007, 2009); D.M.A. (Stony Brook 2015) [2014]
- JENNIFER MCGUIRE, Senior Lecturer in Collaborative Piano  
B.M. (Shorter 2002); M.M. (Cincinnati 2005) [2009]
- JOSHUA MCGUIRE, Senior Lecturer in Aural Skills  
B.M. (Vanderbilt 2003); M.M. (Cincinnati 2005) [2007]
- SARAH MCWHIRT-TOLER, Adjunct Artist Teacher of Dulcimer  
B.A. (Belmont 2012) [2013]
- GREGORY F. MELCHOR-BARZ, Professor of Musicology (Ethnomusicology); Associate Professor of Religion; Associate Professor of Anthropology  
B.M. (North Carolina School of the Arts 1982); M.A. (Chicago 1992); Ph.D. (Brown 1997) [1998]
- SASHA METCALF, Assistant Professor of Musicology  
B.M. (California, Santa Cruz 2008); M.M., Ph.D. (California, Santa Barbara 2011, 2015) [2016]
- EDGAR A. MEYER, Adjunct Associate Professor of Bass  
B.M. (Indiana 1983) [1984]
- STEPHEN MIAHKY, Joseph Joachim Chair; Associate Professor of Violin  
B.M., M.M. (Michigan 2001, 2003); D.M.A. (Rutgers 2009) [2014]
- RYAN MIDDAGH, Senior Lecturer in Jazz Studies; Director of Jazz Studies  
B.M.Ed. (Northern Iowa 2008); M.A. (Middle Tennessee State 2010); D.A. (Northern Colorado 2016) [2014]
- VALERIE MIDDLETON, Adjunct Senior Artist Teacher of Piano  
B.M. (Yankton 1979); M.M. (Colorado 1983) [2007]
- CHERI MONTGOMERY, Lecturer in Voice  
B.M., M.M. (Tennessee 1987, 1990) [2002]
- TYLER SCOTT NELSON, Associate Professor of Voice  
B.Mus., M.M. (Utah 2004, 2006); D.M. (Florida State 2009) [2016]
- CAROL R. NIES, Adjunct Senior Artist Teacher of Conducting  
B.M. (Miami 1979); M.M. (Yale 1981) [1996]
- CRAIG NIES, Associate Professor of Piano  
B.M. (Curtis Institute of Music 1974); M.M., M.M.A. (Yale 1979, 1980); D.Mus.A. (Stony Brook 1991) [1991]
- LESLIE B. NORTON, Associate Professor of French Horn  
B.M., Performer's Certificate (Eastman 1984, 1984) [1989]
- ALLISON EDBERG NYQUIST, Adjunct Professor of Violin  
B.M. (Johns Hopkins 1984); M.M. ( 1985) [2014]
- ROBERT W. PEARCY, Adjunct Associate Professor of Mandolin  
[2009]
- ERIN CHARLES PEREZ, Lecturer in the Teaching of Music  
B.M., M.Ed., Ed.D. (Vanderbilt 2006, 2007, 2014) [2011]
- DERREK C. PHILLIPS, Adjunct Assistant Professor of Percussion  
B.A. (William Paterson 1998) [2010]
- JOE REA PHILLIPS, JR., Senior Artist Teacher of Guitar  
M.S., B.S. (Peabody 1977, 1977) [1985]
- JOHN PITCHER, Adjunct Associate Professor of Music  
B.A. (Catholic University of America 1984); M.S. (Columbia 1998) [2013]
- MARIANNE PLOGER, Associate Professor of Music Perception and Cognition  
B.M. (Missouri, Saint Louis 1976); M.M. (Michigan 1980) [2007]
- CRYSTAL D. PLOHMAN, Senior Artist Teacher of Fiddling  
[1994]
- KATHRYN C. PLUMMER, Professor of Viola  
B.M. (Indiana 1970) [1974]
- MICHAEL PORTER, Adjunct Associate Professor of Music Business  
B.A. (Trevecca Nazarene 2001) [2012]
- TRACY S. PRENTICE, Adjunct Assistant Professor of Voice  
B.M. (Alabama, Huntsville 1978); M.M. (Yale 1981) [1983]
- SUSAN RAMSAY, Adjunct Artist Teacher of Orff/Kodály Methods  
B.M.Ed. (Peabody 1975); M.M.A. (Middle Tennessee State 1982) [2009]
- JAMA A. REAGAN, Senior Artist Teacher of Piano  
B.M. (North Carolina School of the Arts 1987); Associate Diploma (Royal College of Music [England] 1992); Licentiate Diploma (Guildhall School of Music [U.K.] 1995); M.M. (Austin Peay State 2004) [1997]
- DANIEL REINKER, Adjunct Associate Professor of Viola  
B.M. (Cincinnati 1979); M.M. (Yale 1981) [2002]
- JOEL REIST, Adjunct Associate Professor of Bass  
B.F.A. (Carnegie Mellon 1993); M.M. (Rice 1996) [2004]
- MELISSA K. ROSE, Associate Dean, Collegiate Program; Associate Professor of Piano  
B.M. (West Chester 1983); M.M. (Yale 1985); D.M.A. (Michigan 1988) [1996]
- MICHAEL A. ROSE, Associate Professor of Composition  
B.A., M.A. (Pennsylvania 1981, 1982); Ph.D. (Eastman 1985) [1986]
- LEE ROWE, Adjunct Artist Teacher of Dulcimer  
B.F.A. (Virginia Commonwealth 1987) [2006]
- JOSHUA SALAZAR, Lecturer in Music  
B.M., M.M. (Belmont 2013, 2015) [2016]
- JOHN F. SAWYER, Dean of the Blair School of Music, Emeritus; Professor of Music Performance, Emeritus  
B.M. (Mississippi 1953); M.M. (Peabody 1954) [1964]
- PAMELA R. SCHNELLER, Associate Dean, Precollege and Adult Program; Senior Lecturer in Choral Music  
B.S.M.E. (Illinois 1972); M.C.M. (Scarritt 1987) [1988]
- ROLAND A. SCHNELLER, Senior Artist Teacher of Piano, Emeritus  
B.M. (Mount Union 1961); M.M. (Indiana 1963) [1964]
- DOUGLAS SHADLE, Assistant Professor of Musicology  
B.M. (Houston 2004); M.A., Ph.D. (North Carolina 2006, 2010) [2014]
- GAYLE SHAY, Associate Professor of Voice; Director of Vanderbilt Opera Theatre  
B.A. (Luther 1986); M.M. (Maryland 1990); D.M.A. (Colorado 1998) [1998]
- JOSE SIBAJA, Associate Professor of Trumpet  
[2016]
- CHRISTINA SIMPSON, Adjunct Senior Artist Teacher of Suzuki Violin  
B.M. (Cincinnati 1982) [2015]
- MICHAEL K. SLAYTON, Associate Professor of Composition and Theory  
B.A. (Lipscomb 1994); M.M., D.M.A. (Houston 1996, 2000) [1999]
- CARL F. SMITH, JR., Senior Lecturer in Music Composition and Theory  
B.M. (Baldwin-Wallace 1971); M.M. (Washington University 1975) [1998]
- CAROL F. SMITH, Senior Artist Teacher of Suzuki Violin; Director of the Suzuki Program  
M.A.T. (Washington University 1975) [1997]
- ROGER A. SPENCER, Adjunct Artist Teacher of Jazz Ensemble  
B.M.Ed. (Indiana State 1974) [2002]
- BOBBY G. TAYLOR, Professor of Oboe, Emeritus  
B.M.E. (Louisville 1962) [1969]
- CHRISTIAN TEAL, Professor of Violin, Emeritus  
B.M. (Indiana 1969); M.M. (Catholic University of America 1971) [1972]
- RICHARD TODD, Adjunct Associate Professor of Guitar  
B.M. (Cincinnati 1990); M.M. (Southern Methodist 1993); D.Mus.A. (North Texas 2007) [2016]

- ERIC TSATSU, Adjunct Artist Teacher of Music  
[2013]
- CELESTE H. TUTEN, Senior Artist Teacher of Suzuki Violin  
B.M.E. (Peabody 1974); M.Ed. (Memphis State 1976) [1990]
- BRIAN UTLEY, Senior Lecturer in Saxophone  
B.M. (Murray State 1995); M.M., D.M.A. (Louisiana State 1997, 2001)  
[2010]
- THOMAS E. VERRIER, Associate Professor and Director of Wind Studies;  
Senior Band Conductor and Director of Wind Ensembles  
B.M. (Ithaca 1987); M.M. (California State 1994); D.M.A. (Colorado  
1998) [2002]
- PATSY WADE, Adjunct Artist Teacher of Piano  
B.M. (Birmingham-Southern 1971); M.M. (Peabody 1972) [1998]
- MARK WAIT, Martha Rivers Ingram Dean's Chair; Professor of Music;  
Dean of the Blair School of Music  
B.M. (Wichita State 1971); M.M. (Kansas State 1973); D.M.A. (Johns  
Hopkins 1976) [1993]
- DEANNA WALKER, Adjunct Artist Teacher of Piano  
B.M. (Eastern New Mexico, Roswell 1986); M.M. (Johns Hopkins  
1988) [1998]
- FELIX WANG, Professor of Cello  
B.M. (Johns Hopkins 1991); M.M. (New England Conservatory 1992);  
D.M.A. (Michigan 1998) [1999]
- GLEN WANNER, Adjunct Assistant Professor of Bass  
B.M. (Southern California 1986); M.M. (New England Conservatory  
1988) [1994]
- ALISON WARFORD, Adjunct Artist Teacher of Chorus  
B.A. (Oklahoma Baptist 1985); M.Div. (Southern Baptist Theological  
Seminary 1988); M.A. (Vanderbilt 2002) [2008]
- CHRISTINA WATSON, Lecturer in Jazz Vocal Ensemble  
B.A. (Centre 1995); M.A. (Tennessee 1998); Performance Diploma  
(Berklee 2001) [2016]
- ROGER WIESMEYER, Adjunct Associate Professor of Oboe  
B.M. (Curtis Institute of Music 1987) [2002]
- WILLIAM G. WIGGINS, Associate Professor of Percussion  
B.S. (Peabody 1968); M.M. (Northwestern 1989) [1973]
- ANNE H. WILLIAMS, Adjunct Senior Artist Teacher of Suzuki Cello  
B.M. (Kentucky 1965); M.A. (Indiana [Pennsylvania] 1972) [1986]
- DAVID BINNS WILLIAMS, Senior Lecturer in Musicianship and Choral  
Studies  
B.M., M.M. (Indiana 1993, 1995); M.M. (Cincinnati 2000) [1995]
- JEREMY WILSON, Associate Professor of Trombone  
B.M. (Tennessee 2005); M.M. (North Texas 2011) [2012]
- ROBIN WINKOWSKI, Adjunct Artist Teacher of Music  
B.M.A. (Middle Tennessee State 2001) [2013]



## School of Engineering

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# Engineering Education in a University Setting

VANDERBILT University School of Engineering is the largest and oldest private engineering school in the South. Classes offering engineering instruction began in 1879, and seven years later Engineering was made a separate department with its own dean. The school's program emphasizes the relationship of the engineering profession to society and prepares engineers to be socially aware as well as technically competent.

The mission of the School of Engineering is threefold: to prepare undergraduate and graduate students for roles that contribute to society; to conduct research to advance the state of knowledge and technology and to disseminate these advances through archival publications, conference publications, and technology transfer; and to provide professional services to the community.

The school strives to meet the undergraduate education portion of its mission by offering degree programs in fields of engineering relevant to the needs of society. An objective of these programs is to provide a technical education integrated with strong humanities, fine arts, and social sciences subject matter to provide the requisite foundation for life-long learning. The availability of second majors and minors in subject areas in other schools and colleges of the university increases opportunities for engineering students to enhance their education by pursuing studies in the non-technical disciplines. Engineering students take close to 50 percent of their courses outside of the School of Engineering and associate daily with peers from other schools and colleges within the university.

Another objective is to accommodate students who will continue their studies at the graduate level in engineering or in other professional fields, as well as those who intend to enter engineering practice upon graduation. To this end, our programs emphasize mathematics and engineering sciences, yet provide significant exposure to engineering design and hands-on laboratory experiences.

A large fraction of the student body is destined for management positions early in their working careers. To meet these students' needs, the Engineering Management program offers a well-integrated curriculum, including a minor.

The bachelor of engineering serves those programs in engineering where professional registration through state boards is desirable or necessary. Typically, about 90 percent of the students are enrolled in programs that are accredited by the Engineering Accreditation Commission or the Computing Accreditation Commission of ABET (*abet.org*).

The bachelor of science addresses the needs of those students seeking specialized programs not served by conventional engineering degree programs. The degree provides students with a general scientific and engineering background while allowing individual curricular desires to be addressed. For example, students who want to use a degree from the School of Engineering to enter the primary or secondary education fields may include the necessary courses in education from Peabody College in their engineering degree program.

Students at all levels have the opportunity to work with faculty in the generation of new knowledge. Those planning for graduate studies and research may participate in individual topics and research courses to fulfill that desire. Engineering

students also participate in the university's Summer Research Program for Undergraduates.

## Facilities

The School of Engineering is housed in 5 main buildings with several satellite facilities. William W. Featheringill Hall which houses a three-story atrium designed for student interaction and social events, more than fifty teaching and research laboratories with the latest equipment and computer resources, and project rooms. The new Engineering and Science building is an eight-story state of the art building that houses the Innovation Center, numerous research labs, interactive class rooms, clean rooms and space for students to work, study and socialize. School administrative offices and several classrooms are located on the ground floor of the Science and Engineering building in Stevenson Center, which also houses the Biomedical Engineering Department on the 8th and 9th floors. Jacobs Hall, which flanks Featheringill Hall, contains laboratories, office and classrooms serving both the Civil and Environmental Engineering Department and the Electrical Engineering and Computer Science Department. The Olin Hall of Engineering houses Chemical and Biomolecular Engineering, Mechanical Engineering and Materials Science. Several other satellite facilities that are part of the Engineering School include: the W. M. Keck Free Electron Laser Center building, housing the labs and offices of the Biomedical Photonics Center; the LASIR (laboratory for systems integrity and reliability), a hangar-style facility located off-campus dedicated to scaling up experiments to realistic and full size, including a wind tunnel and military aircraft; the MuMS facility (multiscale modeling and simulation); the Vanderbilt Institute of Software Integrated Systems; and the Institute for Space and Defense Electronics, providing office space, dry laboratories and conference space.

In all its engineering programs, Vanderbilt recognizes the valid place of experimental and research laboratories in the learning experience. Laboratories are planned to provide the strongest personal contact between students and faculty members consistent with enrollment.

Well-equipped undergraduate laboratories are maintained by the Departments of Chemistry and Physics in the College of Arts and Science, which offers mathematics and basic science courses required of all engineering students. Graduate and undergraduate divisions of these departments maintain teaching and research facilities in the Stevenson Center for the Natural Sciences, as does the Department of Earth and Environmental Sciences. Another supporting department, Biological Sciences, is housed in Medical Research Building III. Most classes in humanities and the social sciences are conducted in Buttrick, Calhoun, Furman, Garland, and Wilson halls.

## Accreditation

All programs leading to the B.E. degree are accredited by the Engineering Accreditation Commission of ABET (*abet.org*). The bachelor of science program in computer science is accredited by the Computing Accreditation Commission of ABET (*abet.org*).



## Employment of Graduates

Of the recent Vanderbilt graduates with baccalaureate degrees in engineering, about 70 percent entered directly into professional practice. Thirty percent continued with graduate or professional education. Others pursued diverse careers or other interests. Additional information regarding the employment of engineering graduates is available in the Career Center.

## Supporting Organizations

### Vanderbilt Engineering Council

The Engineering Council is a student organization whose main goal is facilitating communication between administration, faculty, and students in the School of Engineering. Officers of the Engineering Council are elected by the engineering student body, and representatives from the professional societies complete the organization's membership. While the council has no administrative power, it provides students with a voice in the decision-making process in the School of Engineering.

### Professional Societies

The leading national engineering societies have chartered branches or student sections at Vanderbilt. These organizations are run locally by students with the help of a faculty adviser. Meetings are devoted to matters of a technical nature, including films, outside speakers, plant trips, and other subjects of interest to the membership.

Student speakers from the Vanderbilt groups compete annually with speakers from other groups in their region in technical paper competitions.

Freshmen and sophomores are cordially invited to attend meetings—and juniors and seniors are urged to join—as they will find the work of the professional societies beneficial in orienting them in their careers.

The student professional societies are:

- American Institute of Aeronautics and Astronautics (A.I.A.A.)
- American Institute of Chemical Engineers (A.I.Ch.E.)
- American Society of Civil Engineers (A.S.C.E.)
- American Society of Mechanical Engineers (A.S.M.E.)
- American Society for Metals (A.S.M.)
- Association for Computing Machinery (A.C.M.)
- Institute of Electrical and Electronics Engineers (I.E.E.E.)
- International Society for Hybrid Microelectronics (I.S.H.M.)
- International Society for Optics and Photonics (SPIE)
- National Society of Black Engineers (N.S.B.E.)
- Society of Automotive Engineers (S.A.E.)
- Society of Hispanic Professional Engineers (S.H.P.E.)
- Society of Engineering Science (S.E.S.)
- Society of Women Engineers (S.W.E.)
- Vanderbilt Biomedical Engineering Society

Graduating seniors may join the Order of the Engineer, a society that recognizes the commitment of its members to the profession of engineering.

# Degree Programs in Engineering

**B**ACHELOR of engineering degree programs are offered in the areas of biomedical, chemical, civil, computer, electrical, and mechanical engineering. Many of these programs allow considerable flexibility—but students are required to include in their courses of study those bodies of knowledge fundamental to each discipline.

Bachelor of science degree programs offered in the interdisciplinary engineering disciplines often allow strong concentration in other areas of engineering or in the College of

Arts and Science. The B.S. is awarded in the areas of computer science and engineering science.

The School offers the master of engineering (M.Eng.), with emphasis on engineering design and practice, in most areas of study. The Graduate School, through departments of the School of Engineering, offers the research-oriented Ph.D. and M.S. degrees in eight major fields. Degree programs offered by the School of Engineering are shown below.

## Degree Programs

	B.E.	B.S.	M.Eng.	M.S.	Ph.D.
Biomedical Engineering	•		•	•	•
Chemical Engineering	•		•	•	•
Civil Engineering	•		•	•	•
Computer Engineering	•				
Computer Science		•		•	•
Electrical Engineering	•		•	•	•
Engineering Science		•			
Environmental Engineering			•	•	•
Materials Science and Engineering				•	•
Mechanical Engineering	•		•	•	•

## Undergraduate Degrees

### Bachelor of Engineering

The bachelor of engineering is offered in biomedical, chemical, civil, computer, electrical, and mechanical engineering. The B.E. degree requirements vary from 125 to 128 semester hours. Students seeking double majors will require somewhat more credit hours.

### Bachelor of Science

The bachelor of science is offered in computer science and engineering science. Each major requires 120 semester hours. These programs have more flexibility in elective choice than the B.E. degree programs.

### The First Year

Many courses normally scheduled for the freshman year are common to both the B.E. and B.S. degree programs. While the curriculum for the freshman year is generally the same for all

students, there are important variations. For example, some major programs require a full year of introductory chemistry; others do not. Students should become familiar with requirements of those programs in which they have an interest and confer with their adviser at the time of enrollment and throughout the freshman year to work out a program of study that will keep options open as long as possible.

Specimen curricula for the engineering programs are given in the Courses of Study chapter. Requirements for the B.E. and B.S. degrees for the various programs vary in the minimum amount of work and specific course requirements in the basic sciences and in specific subject requirements in mathematics.

Included in the freshman year is the course Engineering Science 1401–1403 (Introduction to Engineering), which introduces the student to design tools used in all areas of engineering.

Some students may qualify for advanced placement or advanced credit in mathematics, science, the humanities and social sciences, or computer science. If advanced credit is awarded, it will not affect the student's Vanderbilt grade point average.

## Mathematics and Physics

Entering engineering students will be placed in the appropriate level mathematics course. Students offering one full year or more of high school credit in analytic geometry and calculus may qualify for advanced placement in a regular sequence by scoring well on the Advanced Placement Examination.

Students with high mathematical ability and achievement may apply for enrollment in the Math 2500-2501 sequence as a substitute for Math 2300. For more information, see the course descriptions under Mathematics in the Arts and Science section of this catalog. For majors requiring Math 2420 (Methods of Ordinary Differential Equations), students may select Math 2400 (Differential Equations with Linear Algebra) as a substitute.

Students with inadequate backgrounds in mathematics may be required to take Math 1005 (Pre-calculus Mathematics). Taking this course constitutes an additional requirement for graduation.

Math 1010-1011 (Probability and Statistical Inference) and Math 1100 (Survey of Calculus) cannot be credited toward a degree in the School of Engineering.

Pre-calculus physics courses 1110 and 1110L cannot be credited toward a degree in the School of Engineering.

## Liberal Arts Core

In order to provide the elements of a general education considered necessary for responsible practice as an educated engineer, the School of Engineering requires each student to complete at least 18 hours in the Liberal Arts Core comprising:

1. At least 3 hours selected from courses classified in the AXLE Curriculum Course Distribution of the College of Arts and Science as Humanities and Creative Arts (HCA) with the exception of CMST 1500, 2100, 2110, and 2120, and
2. At least 3 hours selected from courses classified in the AXLE Curriculum Course Distribution of the College of Arts and Science as Social and Behavioral Sciences (SBS).

The remaining hours are to be selected from:

1. Courses classified in the AXLE Curriculum Course Distribution of the College of Arts and Science as Humanities and Creative Arts (HCA), International Cultures (INT), History and Culture of the United States (US), Social and Behavioral Sciences (SBS), and Perspectives (P)
2. CS 1151 and ENGM 2440
3. Arabic 1101, Chinese 1011, 1012, 1101, English 1100, French 1101, German 1101, Greek 1101, Hebrew 1101, Italian 1101, Japanese 1011, 1012, 1101, Latin 1101, Portuguese 1101, Russian 1101, and Spanish 1100, 1101
4. Peabody College courses in Psychology and Human Development numbered 1205, 1207, 1250, 2200, 2250, 2300, 2400, 2500, 2550, 2600, and 3150, and in Human and Organizational Development numbered 1250, 1300, 2100, 2260, 2400, 2500, 2700, and 3232
5. All MUSC, MUSE, MUSO, COMP, MREP, MUTH, and performance courses in the Blair School of Music, except MUSO 1001

## Open Electives

Courses excluded from the listings in the Liberal Arts Core

may be taken as open electives.

## Officer Education

Course offerings in military science and naval science are described in the chapter on Special Programs for Undergraduates near the front of the catalog. All officer education courses designated as eligible for credit may be taken as open electives. In addition, officer education courses in history and political science carry AXLE designations and may be taken as part of the Liberal Arts Core. AFROTC students may count 6 hours of the military courses as open electives.

## Master of Engineering

The master of engineering (M.Eng.) is an advanced professional degree awarded by the School of Engineering and especially designed for engineering practitioners who may prefer to work while doing professional study. It is also suitable for individuals who apply directly from undergraduate school—but the thrust of the program is toward professional practice in engineering rather than research or teaching. The degree is currently offered in biomedical engineering, chemical engineering, civil engineering, electrical engineering, environmental engineering, and mechanical engineering.

Students must complete 30 hours of approved course work. For information on the Accelerated Graduate Program in Engineering degrees, see the chapter on Special Programs. A maximum of 6 hours of graduate-level course work may be transferred from another institution. Residency requirements are flexible, and a maximum period of seven years is allowed to complete the degree. An extensive, written design report shall be submitted on a project approved by the student's project adviser.

Admission to the Master of Engineering program normally requires graduation from an approved undergraduate program in engineering or a related scientific discipline, attainment of a B average in undergraduate courses applicable to the student's career goals, and recommendations containing favorable appraisals of professional promise and attitude. A period of successful work experience prior to application to the program will also be given consideration. Application for admission should be sent to the associate dean of the School of Engineering. Further information about the program may be obtained by writing to the same office.

For international students who did not graduate from an institution in a country where English is the official language, proficiency in English must be shown by a minimum score of 89 on the TOEFL or 7 on the IELTS test.

For information on integrated bachelor and master of engineering degrees, see the chapter on Special Programs.



*Information has been updated since the initial printing. Original pdf is an attachment to this document for comparison.*

# Special Programs

## Honors Programs

Honors programs allow selected undergraduate students to develop individually through independent study and research. Individual honors programs are described in the Courses of Study chapter.

Requirements vary somewhat but, in general, to qualify for consideration a student should have (a) completed the technical course requirements of the first two years, (b) attained a minimum grade average of 3.5 in all work taken for credit, and (c) shown evidence indicating a capacity for independent study and/or research. Formal admission is by election of the department concerned. Once admitted, candidates remain in the program only if they maintain a 3.5 or higher grade average.

Accepted candidates normally begin honors study in the junior year, but exceptions may be made for outstanding seniors.

Successful candidates are awarded Honors in their area of interest. This designation appears on their diplomas.

## Study Abroad

Vanderbilt's Global Education Office offers approximately thirty programs that allow students to take engineering or computer science courses in English abroad, in locations ranging from Dublin to Sydney, Cape Town to Hong Kong. There are no language prerequisites for these programs. These programs also allow students to take a range of liberal arts core and elective courses abroad. A student may not apply to participate in a Vanderbilt approved direct-credit program for transfer credit through a different university or through an external agency and then seek to transfer that credit into Vanderbilt. Financial aid can be used for study abroad during the academic year, and scholarships are available to support summer study abroad. Students are encouraged to discuss with their academic advisers how best to incorporate study abroad into their four-year plans of study. All students intending to receive credit from studying abroad must register their travels in advance with International SOS. Further information can be obtained from the Vanderbilt Global Education Office.

## Teacher Education

Students who are interested in preparing for licensure as secondary school teachers should plan their programs in consultation with the associate dean in the School of Engineering. The School of Engineering and Peabody College offer a teacher education program leading to secondary school licensure in physics (grades 9 through 12) and computer technology. Students major in engineering science in the School of Engineering and complete a second major in education at Peabody College.

More specific information on professional education course requirements can be found under the Licensure for Teaching chapter in the Peabody College section of this catalog. Inquiries can also be made to the Office of Teacher Licensure at Peabody.

## Double Major

It is possible for a student to combine an engineering field with a second area outside the School of Engineering. The student must obtain prior approval of each department and

satisfy the requirements of each major, including the requirement regarding minimum grade point average.

Certain double majors involving two programs within the School of Engineering have been approved by the faculty. The approved double majors are biomedical engineering/electrical engineering, and biomedical engineering/chemical engineering.

The double major is indicated on the student's transcript. Only one degree is awarded, from the school in which the student is enrolled.

## Minors

A minor consists of at least five courses of at least 3 credit hours each within a recognized area of knowledge. A minor offers students more than a casual introduction to an area, but less than a major. A minor is not a degree requirement, but students may elect to complete one or more. Courses may not be taken on a Pass/Fail basis. A minor for which all designated courses are completed with a grade point average of at least 2.0 will be entered on the transcript at the time of graduation.

When a minor is offered in a discipline that offers a major, only those courses that count toward the major may be counted toward the minor. Students should refer to the appropriate sections of this catalog for specific requirements. Currently, minors are offered in engineering management, materials science and engineering, computer science, environmental engineering, energy and environmental systems, nanoscience and nanotechnology, scientific computing, and most disciplines of the College of Arts and Science, Blair School of Music, and Peabody College.

Students should declare their intention to pursue minors by completing forms available in the Student Services Office of the School of Engineering. Departments and programs assign advisers to students who declare minors in their areas. Students are responsible for knowing and satisfying all requirements for the minors they intend to complete.

## Three-Two Program

The School of Engineering recognizes a Three-Two program with certain liberal arts colleges. This plan allows students to attend a liberal arts college for three years of undergraduate study, usually majoring in mathematics or science, where they meet the residence requirements for a degree from that institution. They then transfer to the Vanderbilt University School of Engineering for two years of technical work in an engineering curriculum. Upon completion of the five years, students receive two bachelor's degrees, one from the liberal arts college and one from the School of Engineering. Students who lack the preparation to begin the junior curriculum in their major will need three years at Vanderbilt to complete the bachelor of engineering.

To complete all required technical courses at Vanderbilt in two years, students enrolled in the Three-Two program should complete, before coming to Vanderbilt, as many as possible of the mathematics and science courses listed in the specimen curriculum—in general, mathematics through differential equations, a year of physics, a year of another laboratory science (usually chemistry), and a semester of computer

programming. Students should plan their three years of liberal arts study so as to satisfy as nearly as possible the freshman and sophomore requirements of the particular engineering curriculum in which they will major at Vanderbilt.

Admission to the Three-Two program must be certified by the liberal arts college and is recognized by Vanderbilt University School of Engineering through special agreement between Vanderbilt and each of the liberal arts colleges participating in the Three-Two program.

### **Dual Degree Program with Fisk University**

A coordinated dual degree program between the Vanderbilt University School of Engineering and Fisk University is especially designed to permit students to obtain an A.B. degree in biology, chemistry, computer science, physics, or mathematics from Fisk and a B.E. or B.S. degree in engineering from Vanderbilt, generally within five years.

For the first three years, the student is enrolled at Fisk in a science curriculum and, by cross-registration in the second and third years, takes introductory engineering courses at Vanderbilt. During the fourth and fifth years, the student is enrolled at Vanderbilt, following principally an engineering curriculum at Vanderbilt and completing science courses at Fisk. At the end of five years, the student should be able to satisfy the requirements for both bachelor's degrees.

Financial aid is available for qualified, deserving students. Additional information is available from the director of transfer admissions in the Office of Undergraduate Admissions.

### **Bachelor of Science in Computer Science/Master of Science in Finance**

A program of study is available in which students can obtain a B.S. in computer science from the School of Engineering in four years and be well prepared for admission to the Master of Science in Finance program in the Owen Graduate School of Management. Students spend their fifth year of study at the Owen School. Admission to the Master of Science in Finance program is contingent upon performance. Students receive a strong background in computer programming and economics; minors in engineering management and mathematics are facilitated, providing further depth in preparation for the M.S.F. The recommended curriculum is maintained on the computer science portion of the webpages of the Department of Electrical Engineering and Computer Science.

### **Integrated Bachelor and Master of Engineering**

On the basis of recommendations containing favorable appraisals of professional promise, undergraduate students in the School of Engineering who have completed at least 75 hours with at least a 3.0 grade point average may be accepted into an integrated Bachelor of Engineering–Master of Engineering program. The last two years of a student's program is planned as a unit.

With the approval of the student's adviser, the director of graduate studies in the student's major department, and the senior associate dean, students apply through the associate dean for graduate studies for admission to this integrated dual degree program. Upon admission to this program, a second "career" will be set up for the student which will allow the student to start taking graduate courses (course numbers > 5000) during the junior and senior years. These courses will be credited toward the master of engineering. Note that no double counting of courses is allowed (i.e., the student must

meet the degree requirements for each degree independent of the other degree). The student typically receives the bachelor's degree at the end of the fourth year and completes the master of engineering during the fifth year. Further information can be obtained from the director of graduate studies of the student's major department.

### **Accelerated Graduate Program in Engineering**

Students who enter Vanderbilt with a significant number of credits (20 to 30 hours), earned either through Advanced Placement tests or in college courses taken during high school, may be eligible for the Accelerated Graduate Program in Engineering. Through this program, a student is able to earn both a bachelor's degree and a master of science in about the same time required for the bachelor's degree. To be eligible for the program a student must complete 86 hours (senior standing) by the end of the sophomore year with at least a 3.5 grade point average. With the approval of the student's adviser, the director of graduate studies in the student's major department, and the senior associate dean, students apply through the associate dean for graduate studies for admission to this accelerated dual degree program. Upon admission to this program, a second "career" will be set up for the student which will allow the student to start taking graduate courses (course numbers > 5000) during the junior and senior years. These courses will be credited toward the master of science. Note that no double counting of courses is allowed (i.e., the student must meet the degree requirements for each degree independent of the other degree). The student receives the bachelor's degree at the end of the fourth year and typically spends the summer finishing a master's thesis to complete the master of science. Further information can be obtained from the director of graduate studies of the student's major department.

# Honors

## Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the dean after consideration of faculty recommendations and the grade point averages of the year's summa cum laude graduates.

## Latin Honors Designation

Honors noted on diplomas and published in the Commencement Program are earned as follows:

*Summa Cum Laude.* Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's Vanderbilt graduating seniors.

*Magna Cum Laude.* Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's Vanderbilt graduating seniors.

*Cum Laude.* Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's Vanderbilt graduating seniors.

## Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded hours, with no temporary or missing grades in any course (credit or non-credit) and no grade of F.

## Honor Societies

TAU BETA PI. The Tennessee Beta chapter of the Tau Beta Pi Association was installed at Vanderbilt University 7 December 1946. Members of Tau Beta Pi are selected from undergraduate students in the School of Engineering who have completed at least four semesters of required work, are in the upper eighth of their class scholastically, and have shown marked qualities of character and leadership; seniors in the upper fifth of their class scholastically are also eligible for election.

CHI EPSILON. The Vanderbilt chapter of Chi Epsilon, installed 18 March 1967, is restricted to undergraduate civil engineering students in the top third of their class. Election is based on grade point average, faculty recommendation, and exceptional achievements in extracurricular campus activities.

ETA KAPPA NU. The Epsilon Lambda chapter of the Eta Kappa Nu Association was established 22 April 1966. Undergraduate members are selected from the upper third of the class in electrical engineering. Eta Kappa Nu recognizes leadership and scholastic accomplishment twice annually, selecting members also from the professional body of practicing engineers.

ALPHA SIGMA MU. The Vanderbilt chapter of Alpha Sigma Mu was installed in 1977. Senior materials engineering students in the upper twenty percent of their graduating class are eligible upon recommendation of departmental faculty.

PI TAU SIGMA. The Delta Alpha chapter of Pi Tau Sigma was installed on the Vanderbilt campus 22 April 1971, for the purpose of recognizing scholastic achievement and professional promise in junior and senior mechanical engineering students. Students are elected to membership twice each year on the basis of academic excellence and recommendations from the faculty and chapter members.

SIGMA XI. The Vanderbilt chapter of the Society of the Sigma Xi recognizes accomplishment, devotion, and originality in scientific research. Associate members are elected annually from graduate-level students of the university.

HONOR SOCIETIES FOR FRESHMEN. Freshmen who earn a grade point average of 3.5 or better for their first semester are eligible for membership in the Vanderbilt chapter of Phi Eta Sigma and Alpha Lambda Delta.

## Other Awards and Prizes

DEAN'S AWARD FOR OUTSTANDING SERVICE. Awarded to the senior candidate in the School of Engineering who has shown remarkable leadership qualities and who has also made the greatest contribution in personal services to the School.

DEAN'S AWARD FOR OUTSTANDING SCHOLARSHIP. Awarded to each member of the senior class who graduates summa cum laude.

PROGRAM AWARDS. The faculty associated with each of the departments of the school annually bestows a certificate and a prize to one member of the graduating class who is judged to have made the greatest progress in professional development during his or her undergraduate career.

AMERICAN INSTITUTE OF CHEMISTS AWARD. Awarded to an outstanding undergraduate student majoring in Chemical Engineering on the basis of a demonstrated record of leadership, ability, character, scholastic achievement, and potential for advancement of the chemical professions.

GREG A. ANDREWS MEMORIAL AWARD. Endowed in 1969 and awarded to the senior in civil engineering who has been judged by the faculty to have made the greatest progress in professional development and who plans to do graduate work in environmental and water resources engineering.

THOMAS G. ARNOLD PRIZE. Endowed in 1989 and awarded by the biomedical engineering faculty to the senior who presents the best design of a biomedical engineering system or performance of a research project in the application of engineering to a significant problem in biomedical science or clinical medicine.

WALTER CRILEY PAPER AWARD. Endowed in 1978 and awarded in electrical engineering for the best paper on an advanced senior project in electrical engineering.

JAMES SPENSER DAVIS AWARD. Given annually by the student chapter of Eta Kappa Nu in memory of Mr. Davis, this award recognizes excellence in the undergraduate study of electronics.

ARTHUR J. DYER JR. MEMORIAL PRIZE. Endowed in 1938 and awarded in civil engineering to the member of the senior class doing the best work in structural engineering.

WALTER GILL KIRKPATRICK PRIZE IN CIVIL ENGINEERING. Endowed and awarded in the School of Engineering to the most deserving third-year undergraduate student in civil engineering.

WILSON L. AND NELLIE PYLE MISER AWARD. Awarded to the senior engineering student who has been judged by the faculty of mathematics to have excelled in all aspects of mathematics during his or her undergraduate career.

STEIN STONE MEMORIAL AWARD. Endowed in 1948 and awarded in the School of Engineering to the member of the graduating senior class who has earned a letter in sports, preferably in football, and who is adjudged to have made the most satisfactory scholastic and extramural progress as an undergraduate.

W. DENNIS THREADGILL AWARD. Awarded to a graduating chemical engineering senior for outstanding achievement in the undergraduate program in honor of a former faculty member and department chair.

# Academic Regulations

## Honor System

All academic work at Vanderbilt is done under the honor system (see Life at Vanderbilt chapter).

## Responsibility to Be Informed

It is the responsibility of the student to keep informed of course requirements and scheduling. Failure to do so may jeopardize graduation.

## Academic Advising

A faculty adviser is appointed for each student. This adviser is chosen from the faculty in the student's major, when the major is known. For students who have not chosen a major upon entry, an adviser is selected from faculty in any department. If a student later chooses a different department for his or her major, a corresponding change of adviser is made. Engineering students are required to see their advisers at registration and any other time changes must be made in their programs of study. Any student who has academic difficulty is expected to see his or her faculty adviser for counsel. Faculty advisers can also provide useful career guidance.

## Accreditation and Professional Registration

Legislation exists in the various states requiring registration of all engineers who contract with the public to perform professional work. Although many engineering positions do not require professional certification, Vanderbilt supports registration and encourages its graduates to take the Fundamentals of Engineering examination as soon as they become eligible.

Bachelor of engineering degrees in biomedical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET ([abet.org](http://abet.org)). Students in these programs may take the Fundamentals of Engineering examination as seniors. In addition, proven professional experience is a requirement for registration. Other state boards may have different rules.

## Graduate Record Examination

Most graduate schools, including Vanderbilt's, require or strongly encourage submission of Graduate Record Examination scores as a condition for admission. Further information can be obtained by writing the Educational Testing Service, Box 6000, Princeton, New Jersey 08540.

## Credit Hour Definition

Credit hours are semester hours; e.g., a three-hour course carries credit of three semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practice, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements which exceed

this definition. Certain courses (e.g., dissertation research, ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester will be included in the course description.

## Normal Course Load

Each semester, regular tuition is charged on the basis of a normal course load of 12 to 18 semester hours. No more than 18 or fewer than 12 hours may be taken in any one semester without authorization from the dean. There is an extra charge for more than 18 hours at the current hourly rate. Students permitted to take fewer than 12 hours are placed on probation, unless their light load is necessary because of illness or outside employment. A student must be enrolled in a minimum of 12 hours to be classified as a full-time student.

## Grading System

Work is graded by letter. *A*, *B*, *C*, and *D* are considered passing grades. The grade *F* signifies failure. A student who withdraws from a course before the date given in the Academic Calendar is given the grade *W*. A student may not withdraw from a course after that date.

## Grade Point Average

A student's grade point average is obtained by dividing the total grade points earned by the number of hours for which the student registered, excluding courses taken for no credit, those from which the student has withdrawn, those with the temporary grade of *I* or *M*, and those that are completed with the grade Pass.

## Defined Grades with Corresponding Grade Points Per Credit Hour

A+	= 4.0	C+	= 2.3
A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
		F	= 0.0

## Pass/Fail Course Provision

Students may elect to take a limited number of courses on a Pass/Fail basis. To enroll for a course on a Pass/Fail basis, students must have completed at least two semesters at Vanderbilt, must have achieved at least sophomore standing, and must not be on academic probation.

In addition, the following regulations apply to students enrolled in the School of Engineering:

1. No more than 9 hours graded Pass will be accepted toward the B.S. or B.E. degree, as designated by each program's curriculum.



## Pass/Fail Electives Options by Program

	Open Elective	Liberal Arts Core	Technical Elective
BME	X	X	
CEE		X	
ChBE	X		
CompE	X		
CS	X	X	X
EE	X		
ES	X	X	
ME	X	X	X (non-ME)

2. No more than two courses may be taken on a Pass/Fail basis in any one semester.

3. A minimum of 12 hours must be taken on a graded basis in any semester that a Pass/Fail course is taken. A graduating senior who needs fewer than 12 hours to graduate may take courses on a Pass/Fail basis as long as he or she takes the number of hours needed to graduate on a graded basis.

4. Students may register for grading on a Pass/Fail basis until the close of the Change Period at the end of the second week of classes. Students may change from Pass/Fail to graded status until the deadline date for dropping a course that is published in the Academic Calendar.

Those electing the Pass/Fail option must meet all course requirements (e.g., reports, papers, examinations, attendance, etc.) and are graded in the normal way. Instructors are not informed of the names of students enrolled on a Pass/Fail basis. At the end of the semester, a regular grade is submitted for the student enrolled under the P/F option. Any grade of *D-* or above is converted in the Student Records System to a *P*, while an *F* will be recorded if a student enrolled under this option fails the course. The *P* grade is not counted in the grade point average or used in the determination of honors. The grade of *F* earned under the Pass/Fail option is included in the calculation of the grade point average.

### Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. A student who receives a temporary grade is ineligible for the Dean's List.

### I: Incomplete

The Incomplete (*I*) is a temporary placeholder for a grade that will be submitted at a later date. The grade of *I* is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The *I* is not intended as a replacement for a failing grade, nor should it be assigned if a student simply misses the final examination. The grade of *M* is used for the latter purpose. The request for an *I* is generally initiated by the student but must be approved and assigned by the instructor. When assigning an Incomplete, the instructor specifies (a) a deadline by which the *I* must be resolved and replaced by a permanent grade and (b) a default course grade that counts the missing work as zero. The deadline may be no later than the end of the next regular semester. Extension beyond that time must be approved by the associate dean. If the work is not completed by the deadline the default grade will become the permanent grade for the course. The Incomplete is not calculated in the GPA, but a student who receives an Incomplete is ineligible for the Dean's List.

### M: Missed Final Examination

The grade of *M* is given to a student who misses the final examination and is not known to have defaulted, provided the student could have passed the course had the final examination been successfully completed. The grade of *F* is given if the student could not pass the course even with the final examination. It is the student's responsibility to contact the Office of the Dean before the first class day of the next regular semester to request permission to take a makeup examination. The makeup examination must be taken on or before the tenth class day of the next regular semester. If the request has not been submitted by the proper time, or if the student fails to take the makeup examination within the prescribed time, the *M* grade will be replaced by a default grade submitted by the instructor when the *M* is assigned.

### F: Failure

A subject in which the grade *F* is received must be taken again in class before credit is given. A student who deserts a course without following the correct procedure for dropping it will receive an *F* in the course.

*Senior Re-examination.* A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed prevents the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from re-examination. The re-examination must be requested through the student's Dean's Office, and, if approved, it is given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination will receive a *D-* in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course. For engineering students taking engineering courses, the senior re-examination policy applies if a student fails not more than one course in the senior year.

### RC: The Repeated Course Designator

Courses in which a student has earned a grade lower than *B-* may be repeated under certain conditions. A course in which the student earned a grade between *D-* and *C+*, inclusive, may be repeated only once. The repeat must be accomplished within one year of the first attempt for courses offered every year, or, for courses not offered within a year, the first time the course is offered. Failed courses may be repeated at any time. A course may be repeated only on a graded basis, even if the course was originally taken Pass/Fail. Courses taken Pass/Fail in which the student earned a Pass may not be repeated. When registering for a course previously completed, the student must indicate that the course is being repeated. A course cannot be repeated through credit by examination.

Students should note that repeating a course may improve the grade point average, but it may also lead to problems in meeting minimum hour requirements for class standing and progress toward a degree. Repeating a course does not increase the number of hours used in calculation of the grade point average. All grades earned will be shown on the transcript, but only the latest grade will be used for computation of grade point averages.

### *W: Withdrawal*

A student may withdraw from a course at any time prior to the deadline for withdrawal published in the Academic Calendar. The deadline is usually the Friday following the date for reporting mid-semester deficiencies. The *W* is recorded for any course from which a student withdraws. A course in which a *W* is recorded is not used in figuring grade point averages.

### **Requirements for the Degree**

Candidates for a degree must have completed satisfactorily all curriculum requirements, have passed all prescribed examinations, and be free of indebtedness to the university.

### *Grade Average Requirements*

To be eligible for graduation, a student must have passed all required courses, including the technical electives, and shall have earned a minimum average grade of *C* in (a) all courses taken, (b) courses taken within the School of Engineering, and (c) department courses of each major.

Any student who has been on probation for failure to meet the semester grade point average requirements in two successive semesters may be dropped for failure to meet the requirement in a third successive semester.

### *Hours Required for Graduation*

The specific course requirements and total hours required for the bachelor's degree vary with the student's major program. Detailed requirements for each program are shown in the specimen curricula in the Courses of Study section. If graduation requirements change during the time students are in school, they may elect to be bound by the requirements published in the catalog in either their entering or their graduating year.

### **Transfer Credit**

It is the student's responsibility to provide all information needed for an assessment of the program for which transfer of credit is requested. Work transferred to Vanderbilt from another institution will not carry with it a grade point average. No course in which a grade below *C-* was received will be credited toward a degree offered by the School of Engineering.

Transfer students must complete at least 60 hours of work at Vanderbilt. Two of the semesters must be the senior year.

### *Summer Work at Another Institution*

Work that a student contemplates taking at a summer school other than Vanderbilt is treated as transfer work and must be approved in advance in writing by the student's adviser and the associate dean in the School of Engineering, at which time a course description must be submitted. A course a student has taken at Vanderbilt may not be repeated in another institution to obtain a higher grade.

### **Credit by Examination**

In certain circumstances students may be awarded course credit by departmental examination. (This procedure is distinct from the award of credit through the College Board Advanced Placement Examinations, taken prior to a student's first enrollment at Vanderbilt or another college.)

Students who want to earn credit by departmental examination should consult the associate dean concerning procedures. To be eligible, students must be in good standing.

Students must obtain the approval of the chair of the department that is to give the examination and of the instructor designated by the chair. Students may earn up to 8 hours of credit by examination in any one department, although this limitation might be raised on petition to the Administrative Committee. Students may attempt to obtain credit by examination no more than twice in one semester, no more than once in one course in one semester, and no more than twice in one course.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 hours are not charged tuition for hours for which credit by examination is awarded, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses dropped after the change period of registration. Students in this category must pay a fee of \$50 for the cost of administering the examination. Full-time students with a tuition load exceeding 18 hours and students taking fewer than 12 hours pay tuition at the regular rate with no additional fee.

### **Registration**

A period is designated in each semester during which continuing students, after consultation with their advisers, register for work to be taken during the next term. Students can access both their registration appointment times and the registration system via YES (Your Enrollment Services) at [yes.vanderbilt.edu](http://yes.vanderbilt.edu).

### **Auditing**

Regularly enrolled students in the School of Engineering who want to audit courses in any of the undergraduate schools of the university must get the written consent of the instructor to attend the class but do not register for the course for credit. Forms are available from the School of Engineering Office of Academic Services. No permanent record is kept of the audit. Regular students may audit one class each semester.

### **Change of Course**

During the change period of registration as defined in the Academic Calendar, students may add or drop courses without academic penalty after securing approval from their adviser. After the change period, new courses may not be added, except under very unusual circumstances and with the approval of the adviser, the course instructor, and the associate dean.

A student may drop a course without entry on the final record, provided the course is dropped during the change period of registration. After the first week of classes and extending to the end of the eighth week, a course may be dropped with approval of the student's adviser; a *W* (withdrawal) will be recorded.

To drop a course or change sections after the change period ends, the student must procure a Change of Course form from the Office of Academic Services. The student then obtains the signature of his or her adviser and of all instructors involved in the proposed change and returns the form to the Office of Academic Services.

## Examinations

Examinations are usually given at the end of each semester in all undergraduate courses except for certain laboratory courses or seminars. Exams will be no longer than three hours in length and are given according to the schedule published in the *Schedule of Courses* (the School of Engineering does not offer an alternate examination schedule). All examinations are conducted under the honor system.

## Residence Requirements

A minimum of four semesters including the last two semesters shall be spent in residence in the School of Engineering. During these four or more semesters, the student must have completed at least 60 semester hours of an approved curriculum in one of the degree programs. In unusual cases, an exception to this requirement may be made by the Administrative Committee upon the recommendation of the department concerned.

## Class Standing

To qualify for sophomore standing, a student must earn a minimum of 24 hours and maintain a grade point average of at least 1.8 and have completed two regular semesters. For the purposes of class standing, a regular semester is defined as any fall or spring term in which a student is registered for at least 12 hours. Freshmen who fail to qualify for sophomore standing after two semesters are placed on probation. Freshmen who fail to qualify for sophomore standing in three semesters may be dropped. The summer session counts as a semester for this purpose.

To qualify for junior standing, a student must earn a minimum of 54 hours and maintain a grade point average of at least 1.9 and have completed four regular semesters. Sophomores who fail to qualify for junior standing at the end of two semesters after qualifying for sophomore standing are placed on probation. A student who has been on probation for failure to qualify for junior standing and who does not qualify for junior standing in one extra semester may be dropped.

A student who has qualified for junior standing has two semesters to qualify for senior standing. Senior standing requires the completion of 86 hours and a minimum grade point average of 2.0 and the completion of six regular semesters. Juniors who do not qualify for senior standing at the end of the second semester after qualifying for junior standing will be placed on probation. A student who has been on probation for failure to qualify for senior standing and who does not qualify for senior standing in one extra semester may be dropped.

Seniors who do not qualify for graduation at the end of the second semester after being promoted to the senior class will be placed on probation and given one more semester to complete the graduation requirements. A senior who has been on probation for failing to complete the graduation requirements and who fails to complete the requirements in one additional semester may be dropped.

## Probation

A freshman who fails to complete 9 hours and earn a 1.7 grade point average during any semester is placed on probation. A sophomore, junior, or senior who fails to complete 12 hours and earn a 2.0 grade point average during any semester is placed on probation. The student is removed from probation after completing 12 hours and earning a 2.0 grade point average during any semester provided that sufficient credit hours are obtained for promotion to the next class.

Full-time sophomores are removed from probation after earning 12 hours and a 2.0 grade point average in a given semester, except that those who have not qualified for junior standing after two semesters as a sophomore must in the next semester fulfill the requirement for junior standing. Failure to do so will cause the student to be dropped.

A student who fails all courses in any semester will be dropped.

To remain in good standing, a student must pursue a program leading toward a degree in the School of Engineering. A student who is deemed by the Administrative Committee not to be making satisfactory progress toward a degree in engineering will be dropped.

A student authorized by the Administrative Committee to carry fewer than 12 hours because of illness or outside employment, or for some other valid reason, may be placed on probation if the student's work is deemed unsatisfactory by the Administrative Committee and will be removed from probation when the committee deems the work satisfactory.

## Class Attendance

Students are expected to attend all scheduled meetings of each class in which they are enrolled. At the beginning of each semester, instructors will explain the policy regarding absences in each of their classes. Students having excessive absences will be reported to the Office of the Dean. If class attendance does not improve thereafter, the student may be dropped from the class with the grade *W*, if passing at the time, or the grade *F*, if failing at the time. Class attendance may be a factor in determining the final grade in a course.

## Scholarship Requirements

Those students having honor scholarships are expected to maintain a 3.0 grade point average while taking a minimum of 12 hours. Failure to maintain a 3.0 grade point average each year will result in the cancellation of the scholarship.

## Grade Reports

A grade report will be available to the student on Academic Record in YES as soon as possible after the conclusion of each semester. This report will give the total hours and grade points earned during the semester, as well as the cumulative hours and grade points earned through that semester. Students should examine these reports carefully and discuss them with their faculty advisers. Any errors should be reported immediately to the Office of Academic Services of the School of Engineering.

A grade reported and recorded in the Office of the University Registrar may be changed only upon written request of the instructor and with approval of the Administrative Committee. The committee will approve such a change only on certification that the original report was in error.

## Undergraduate Enrollment for Graduate Credit

A qualified Vanderbilt junior or senior may enroll in courses approved for graduate credit by the graduate faculty and receive credit which, upon admission to the Vanderbilt University Graduate School, may be applicable toward a graduate degree. The principles governing this option are as follows:

1. Work taken under this option is limited to courses numbered 5000 and above and listed in the catalog of the

Graduate School, excluding thesis and dissertation research courses and similar individual research and reading courses.

2. Such work must be in excess of that required for the bachelor's degree.
3. The student must, at the time of registration, have a 3.0 grade point average in the preceding two semesters.
4. The total course load, graduate and undergraduate courses, must not exceed 18 hours in any one semester.
5. Undergraduate students who want to count for graduate credit courses taken under this option must consult the instructor of each course and must, at the time of registration, declare their intention on a form available in the Office of Academic Services.
6. Permission for Vanderbilt undergraduates to enroll in graduate courses does not constitute a commitment on the part of any program to accept the student as a graduate student in the future.
7. An undergraduate student exercising this option will be treated as a graduate student with regard to class requirements and grading standards.

All students who want to take courses numbered 5000 or above, whether under this option or not, must obtain the written approval of their academic adviser and the instructor of the course.

Interested students should consult their faculty advisers before attempting to register for graduate courses under this option.

### **Leave of Absence**

A student at Vanderbilt or one who has been admitted to Vanderbilt may, with the approval of his or her academic dean, take an official leave of absence for as much as two semesters and a summer session. Leave of absence forms are available in the Office of Academic Services. A student who fails to register in the university at the end of the leave will be withdrawn from the university.

### **Change of Address**

Any change of address should be reported to the School of Engineering Office of Academic Services or the Office of the University Registrar. The university will consider notices or other information delivered if mailed to the address on file in YES.

### **Special Students**

The normal program of study is 12 to 18 hours per semester. Students authorized by the Administrative Committee to register for fewer than 12 hours are classified as special students.

### **Withdrawal from the University**

A student proposing to withdraw from the university must notify the Office of Academic Services of the School of Engineering so that proper clearance may be accomplished and that incomplete work is not charged as a failure against the student's record.

# Courses of Study

Hours are semester hours. The bracketed [3] indicates 3 semester hours of credit for one semester, and [3–3] for a two-semester course.

1000–1999: Lower-level introductory courses. Generally no prerequisite.

2000–2999: Intermediate undergraduate courses. May have prerequisite courses.

3000–4999: Upper-level undergraduate course. Usually have prerequisite courses.

5000+: Courses for graduate credit.

W symbols used in course numbers designate courses that meet departmental writing requirements.

## Abbreviations

BME	Biomedical Engineering
CE	Civil Engineering
CHBE	Chemical and Biomolecular Engineering
CMPE	Computer Engineering
CS	Computer Science
EECE	Electrical Engineering and Computer Engineering
ENGM	Engineering Management
ES	Engineering Science
ENVE	Environmental Engineering
ME	Mechanical Engineering
MSE	Materials Science and Engineering
NANO	Nanoscience and Nanotechnology
SC	Scientific Computing

## The Freshman Year

The freshman year curriculum for all of the engineering disciplines is:

### Specimen Curriculum

FALL SEMESTER		Semester hours
<b>CHEM 1601</b>	General Chemistry	3
<b>CHEM 1601L</b>	General Chemistry Laboratory	1
<b>MATH 1300</b>	Accelerated Single-Variable Calculus I	4
<b>ES 1401–1403</b>	Introduction to Engineering	3
	Elective	3
	<b>Total</b>	<b>14</b>

SPRING SEMESTER		Semester hours
<b>CHEM 1602‡</b> and <b>CHEM 1602L</b>	General Chemistry and General Chemistry Laboratory	3 1
or <b>MSE 1500‡</b> and <b>MSE 1500L</b>	Materials Science I and Materials Science Laboratory	3 1
<b>MATH 1301</b>	Accelerated Single-Variable Calculus II	4
<b>PHYS 1601</b>	General Physics I	3
<b>PHYS 1601L</b>	General Physics Laboratory I	1
<b>ES 1115</b>	Engineering Freshman Seminar (optional)	1
<b>CS 1101</b> or <b>1103</b>	Programming and Problem Solving	3
	<b>Total</b>	<b>15–16</b>

‡ Chemical engineering and biomedical engineering majors must take CHEM 1602 and 1602L.

Civil engineering majors must take an area of science in addition to chemistry and physics to satisfy the program basic science elective requirements.

# Biomedical Engineering

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 ADJOINT ASSOCIATE PROFESSOR Stacy S. Klein-Gardner  
 ADJUNCT ASSISTANT PROFESSORS Valerie Guent, Judy T. Lewis  
 ADJOINT ASSISTANT PROFESSORS Chetan Patil, Amber Simpson

THE foundations of biomedical engineering are the same as those in other engineering disciplines: mathematics, physics, chemistry and engineering principles. Biomedical engineering builds on these foundations to solve problems in biology and medicine over the widest range of scales—from the nanoscale and molecular levels to the whole body. Biomedical engineering provides a robust platform for employment in the medical device and instrumentation industries as well as careers in companies that specialize in the development and application of biologics, biomaterials, implants and processes. Our graduates gain entry into nationally recognized graduate schools for continuing studies in biomedical engineering. Biomedical engineering is also a rigorous path for admission to and success in medical school for those students willing and able to excel in mathematics, physics, chemistry, biology, physiology and engineering.

The Department of Biomedical Engineering at Vanderbilt is unique among biomedical engineering programs in its immediate proximity to the world class Vanderbilt Medical Center, located on our compact campus. Our School of Medicine is among the top ten in funding from the National Institutes of Health and includes a National Cancer Institute-recognized Comprehensive Cancer Center, a major children's hospital and a Level I trauma center. This proximity and the strong relationships among faculty across multiple schools stimulate high impact research and provide unique educational and research opportunities for students.

*Degree Programs.* The Department of Biomedical Engineering offers courses of study leading to the B.E., M.S., M.Eng., and Ph.D. Vanderbilt biomedical engineering is a well established program with undergraduate degrees granted continuously since 1965. Our undergraduate curriculum undergoes regular review and revision to ensure relevancy and to maintain full ABET accreditation. Students have complete flexibility in the selection of biomedical engineering, technical, and open electives. This allows focus and depth in areas such as biomaterials and tissue engineering, biomedical imaging, biophotonics, bionanotechnology, modeling, therapy guidance systems, and biomedical instrumentation. Double majors with electrical engineering and with chemical engineering are available.

*Facilities.* The Department of Biomedical Engineering is located in Stevenson Center. Undergraduate instructional laboratories are equipped for study of biomedical processes, measurement methods and instrumentation. These facilities are equipped with embedded systems for instrumentation, design, and testing that mirror professional practice. Specialized facilities for biomedical imaging, biophotonics, technology-guided therapy including surgical guidance systems, biomaterials and tissue engineering, and nanobiotechnology for cellular engineering and nanomedicine are used both for faculty-led research and instructional purposes.

*Undergraduate Honors Program.* With approval of the Honors Program director, junior and senior students in biomedical engineering who have achieved a minimum grade point average of 3.5 may be accepted into the undergraduate Honors Program. Students in the program take at least 6 credit hours of 5000-level or above (graduate) biomedical engineering courses, which can be counted toward the 127-hour undergraduate degree requirements as biomedical engineering electives or which can be taken for graduate school credit. Students in the Honors Program must also complete a two-semester-long research project and present a research report; this is generally accomplished through the BME 3860 and 3861 Undergraduate Research elective courses. Honors students must make a grade point average of 3.0 in these classes and maintain an overall 3.5 GPA to be designated as an honors graduate. The diploma designation is Honors in Biomedical Engineering.

## Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.E. in biomedical engineering requires a minimum of 127 hours, distributed as follows:

1. Mathematics (15 hours): MATH 1300, 1301, 2300, 2400.
2. Basic Science (20 hours): CHEM 1601/1601L, 1602/1602L; PHYS 1601/1601L, 1602/1602L; BSCI 1510/1510L.
3. Introductory engineering and computing (6 hours): ES 1401, 1402, and 1403, and either CS 1103 (preferred) or CS 1101.
4. Electrical engineering (7 hours): EECE 2112, 2213, 2213L.
5. Biomedical engineering (31 hours): BME 2100, 2200, 3000, 3100, 3101, 3200, 3300, 4900W, 4950, 4951, 4959.
6. Biomedical engineering electives (12 hours) comprising:
  - i) BME elective courses numbered 2210 and higher.
  - ii) Up to 3 hours total of BME 3860, 3861. An additional 3 hours of BME 3860-3861 may be used as technical electives.

- iii) Any one of the following: CHBE 4500, 4810, 4870; EECE 3214, 4353, 4354; ENVE 4610; ME 2220. This option does not apply to BME/EE double majors.
  - iv) BME graduate courses, with the exception of BME 8991–8994, provided the student has a 3.5 GPA and appropriate permissions.
7. Technical electives (12 hours) comprising:
- i) BME electives taken above the 12 credit hour minimum. Up to 3 hours of BME 3860–3861 or other independent study courses in the School of Engineering may be taken as technical electives.
  - ii) Courses in the School of Engineering except CHBE 3300, CE 2200, CS 1151, ENGM 2440, ME 2170, and listings in Engineering Science.
  - iii) Courses numbered 2000 or higher in the College of Arts and Science listed in the mathematics and natural sciences (MNS) AXLE distribution category except MATH 2610, 2810, 2820, 3000, and PHYS 2805 (if credit is given for BME 4400).
  - iv) BSCI1511, 1511L.
  - v) NURS 1500, 1601-1602, 5105.
8. Liberal Arts Core (18 hours) to be selected to fulfill the Liberal Arts Core requirements listed under Degree Programs in Engineering.
9. Open electives (6 hours).

Undergraduates in biomedical engineering may apply the pass/fail option only to courses taken as liberal arts core or open electives, subject to school requirements for pass/fail.

### Double Majors

I. The double major in biomedical and electrical engineering requires a minimum of 129 semester hours. The requirements include those numbered 1, 2, 3, 5, and 8 for the B.E. in biomedical engineering and the following:

a. Biomedical engineering electives (3 hours): BME elective courses numbered 2210 and higher.

b. Electrical engineering (21 hours): EECE 2112, 2116, 2116L, 2213, 2213L, 3214, 3233, 3235, 3235L.

c. Electrical engineering electives (15 hours) selected as described by item 6 of the Curriculum Requirements in the electrical engineering section of the catalog, but totaling at least 15 hours. Students must complete at least two courses in each of two areas of concentration listed under electrical engineering in the *Undergraduate Catalog*. At least one course must be a domain expertise course as designated in the catalog. BME 3300 may be included toward satisfying the area of concentration requirement but cannot be counted as an electrical engineering elective.

A specimen curriculum for the double major with electrical engineering can be found on the biomedical engineering department's website.

II. The double major in biomedical and chemical engineering requires a minimum of 131 hours and is described in the chemical engineering section of the catalog under its curriculum requirements.



### Specimen Curriculum for Biomedical Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
<b>BSCI 1510, 1510L</b>	Introduction to Biological Sciences with Laboratory	4	–
<b>BME 2100</b>	Introductory Biomechanics	3	–
<b>BME 2200</b>	Biomedical Materials	–	3
<b>MATH 2300</b>	Multivariable Calculus	3	–
<b>MATH 2400</b>	Differential Equations with Linear Algebra	–	4
<b>PHYS 1602, 1602L</b>	General Physics with Laboratory II	4	–
<b>EECE 2112</b>	Circuits I	–	3
	Biomedical Engineering or Technical Elective	–	4
	Liberal Arts Core	3	3
		17	17
JUNIOR YEAR			
<b>BME 3000</b>	Physiological Transport Phenomena	3	–
<b>BME 3100, 3101</b>	Systems Physiology	3	3
<b>BME 3200</b>	Analysis of Biomedical Data	–	3
<b>BME 3300</b>	Biomedical Instrumentation*	–	4
<b>EECE 2213, 2213L</b>	Circuits II	4	–
	Biomedical Engineering or Technical Elective	3	4
	Liberal Arts Core	–	3
	Open Elective	3	–
		16	17

SENIOR YEAR		Semester hours	
		FALL	SPRING
<b>BME 4900W</b>	Biomedical Engineering Laboratory	3	—
<b>BME 4950, 4951</b>	Design of Biomedical Engineering Systems I, II	2	3
<b>BME 4959</b>	Senior Engineering Design Seminar	1	—
	Biomedical Engineering or Technical Elective	7	6
	Liberal Arts Core	3	3
	Open Elective	—	3
		16	15

\* BME 3300 may also be taken in the fall of the senior year.

Course descriptions begin on page 317.

## Chemical Engineering

CHAIR G. Kane Jennings

DIRECTOR OF GRADUATE PROGRAM Clare M. McCabe

DIRECTOR OF UNDERGRADUATE STUDIES Paul E. Laibinis

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PROFESSORS Peter T. Cummings, Todd D. Giorgio, Scott A. Guelcher, G. Kane Jennings, David S. Kosson, Paul E. Laibinis, Matthew J. Lang, Clare M. McCabe, K. Arthur Overholser, Peter N. Pintauro, Sandra J. Rosenthal

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ASSOCIATE PROFESSOR EMERITUS Kenneth A. Debelak

ASSOCIATE PROFESSORS Eva M. Harth, Bridget R. Rogers, Jamey D. Young

ASSISTANT PROFESSORS Rizia Bardhan, Kelsey B. Hatzell, Shihong

Lin, Ethan S. Lippmann, John T. Wilson, Marija Zanic

CHEMICAL engineers play key roles in the development and production of commodity chemicals, pharmaceuticals, and bioengineered materials, high strength composites and specialty polymers, semiconductors and microelectronic devices, and a wide range of ultrapure fine chemicals. Indeed, chemical engineering is essential for the operation of contemporary society. The solutions to many of the problems that we face today—e.g., energy, the environment, development of high-performance materials—will involve chemical engineers.

The undergraduate program in chemical engineering prepares students to contribute to the solution of these and similar problems. Graduates find meaningful careers in industry, in government laboratories, and as private consultants. Some continue their education through graduate studies in chemical engineering, business, law, or medicine.

**Mission.** The mission of the Department of Chemical and Biomolecular Engineering is to educate those who will advance the knowledge base in chemical engineering, become practicing chemical engineers, and be leaders in the chemical and process industries, academia, and government; to conduct both basic and applied research in chemical engineering and related interdisciplinary areas; and to provide service to the chemical engineering profession, the School of Engineering, Vanderbilt University, the country, and the world.

**Degree Programs.** The Department of Chemical and Biomolecular Engineering offers the bachelor of engineering in chemical engineering and graduate study leading to the M.Eng., M.S., and Ph.D.

Undergraduate chemical engineering students acquire a solid background in mathematics, chemistry, biology, and physics. The chemical and biomolecular engineering program has as its basis

courses in transport phenomena, thermodynamics, separations, and kinetics. Other courses deal with the principles and techniques of chemical engineering analysis and design, along with economic analysis, process control, chemical process safety, and engineering ethics. Laboratory courses offer the student an opportunity to make fundamental measurements of momentum, heat, and mass transport and to gain hands-on experience with bench scale and small scale pilot-plant apparatus, which can be computer controlled. Report writing is a principal focus in the laboratory courses. Many students have the opportunity to carry out individual research projects.

A specimen curriculum for a chemical engineering major follows. This standard program includes a number of electives. Students, in consultation with their faculty advisers, may choose elective courses that maintain program breadth or may pursue a minor or focus area with their chemical engineering major. Specimen curricula for the various focus areas are available on the department website. Double majors may be arranged in consultation with a faculty adviser.

The chemical and biomolecular engineering department recommends that students consider taking the Fundamentals of Engineering Examination (FE) in their senior year. This is the first step in obtaining a license as a professional engineer. The following courses are recommended for preparation for the FE: EECE 2112, CE 2280, and ME 2190.

**Undergraduate Honors Program.** The Honors Program in chemical engineering provides an opportunity for selected students to develop individually through independent study and research. General requirements are described in the Special Programs chapter. The chemical and biomolecular engineering department requires a minimum overall GPA of 3.5. Acceptance to the program is made by petition to the faculty during the junior year. Transfer students may be considered for admission after completing one semester at Vanderbilt. Candidates for honors choose their technical courses with the consent of a faculty honors adviser. Requirements include at least 6 hours of CHBE courses numbered 5000 or above, plus 6 hours of CHBE 3860 and 3861 taken in the junior and/or senior year under the direction of a faculty honors adviser. A formal written research report is submitted each semester CHBE 3860 or 3861 is taken with a final report and presentation given in the spring semester of the senior year to the CHBE faculty and students. The diploma designation is Honors in Chemical Engineering.

**Facilities.** The chemical and biomolecular engineering department is located in Olin Hall of Engineering. Departmental laboratories are equipped for study of transport phenomena, unit operations, kinetics, and process control. Current research areas for which facilities are available include molecular modeling; adsorption and surface chemistry; biochemical engineering and biotechnology; materials; energy and the environment.



## Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.E. in chemical engineering requires a minimum of 126 hours, distributed as follows:

1. Mathematics (14 hours): MATH 1300, 1301, 2300, 2420.
2. Basic Science (24 hours): CHEM 1601/ 1601L, 1602/1602L, 2221/2221L, 2222/2222L; PHYS 1601/1601L, 1602/1602L.
3. Engineering Fundamentals (6 hours): ES 1401, 1402, 1403; CS 1103.
4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
5. Chemical and Biomolecular Engineering (39 hours): CHBE 2100, 2200, 2250, 3200, 3250, 3300, 3350, 3600, 3900W, 4900W, 4950W, 4951W, 4959.
6. Science electives (6 hours): BSCI 1510 or CHBE 2150; CHEM 3300 (preferred) or BSCI 2201 or BSCI 2520.
7. Chemical and Biomolecular Engineering electives: 6 hours selected from CHBE courses numbered 4000 and above.
8. Technical electives (6 hours). To be selected from: a) courses in BME, CHBE, CE, CS, EECE, ENVE, ME, MSE, NANO, and SC, except BME 2201 and CS 1151; b) courses numbered 1500 or above in the College of Arts and Science listed in the mathematics and natural sciences (MNS) AXLE distribution category; and c) ENGM 2160, 3000, 3010, 3100, 3300, 3650, 3700, 4500.
9. Open electives (7 hours).

Undergraduates in chemical engineering, including double majors with chemical engineering, may apply the pass/fail option only to courses taken as open electives, subject to the school requirements for pass/fail.

## Double Majors

I. The double major in chemical engineering and biomedical engineering requires a minimum of 131 semester hours. The requirements include those numbered 2, 3, and 4 for the B.E. in chemical engineering and the following:

- a) Mathematics (15 hours): MATH 1300, 1301, 2300, 2400.
- b) Biology (4 hours): BSCI 1510, 1510L.
- c) Chemical and Biomolecular Engineering (26 hours): CHBE 2100, 2200, 3200, 3250, 3300, 3350, 3900W, 4950W.
- d) Biomedical Engineering (25 hours): BME 2100, 2200, 3100, 3101, 3300, 4900W, 4950, 4951, 4959.
- e) Electrical Engineering (7 hours): EECE 2112, 2213, 2213L.
- f) CHBE elective: 3 hours selected from CHBE 4500, 4810, 4820.

g) BME elective: 3 hours selected from BME courses numbered above 2000 except BME 2201, 3000, 3200, 6110, 8991–8994.

II. The double major in chemical engineering and chemistry requires a minimum of 130 semester hours. The requirements include those numbered 1, 2, 3, 4, and 7 for the B.E. in chemical engineering and the following:

- a) Chemical and Biomolecular Engineering (36 hours): CHBE 2100, 2200, 2250, 3200, 3250, 3300, 3350, 3900W, 4950W, 4951W, 4959; CHBE 3600 or 4830.
- b) Science (23 hours): CHEM 2100, 2100L, 3010, 3300, 3315, 4965, 4966; BSCI 1510 or CHBE 2150; BSCI 2520.
- c) Engineering Elective: 3 hours selected from courses numbered 2000 or above in BME, CHBE, CE, CS, EECE, ENVE, and ME, except BME 2201 and 3830.

## Specimen Curriculum for Chemical Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
<b>CHEM 2221, 2222</b>	Organic Chemistry	3	3
<b>CHEM 2221L, 2222L</b>	Organic Chemistry Laboratory	1	1
<b>MATH 2300</b>	Multivariable Calculus	3	–
<b>MATH 2420</b>	Methods of Ordinary Differential Equations	–	3
<b>PHYS 1602</b>	General Physics II	3	–
<b>PHYS 1602L</b>	General Physics Laboratory II	1	–
<b>CHBE 2100</b>	Chemical Process Principles	3	–
<b>CHBE 2200</b>	Chemical Engineering Thermodynamics	–	3
<b>CHBE 2250</b>	Modeling and Simulation in Chemical Engineering	–	3
	Liberal Arts Core	3	3
		<hr/>	<hr/>
		17	16
JUNIOR YEAR			
<b>CHBE 2150</b>	Molecular and Cell Biology for Engineers	3	–
<b>CHBE 3200</b>	Phase Equilibria and Stage-Based Separations	3	–
<b>CHBE 3250</b>	Chemical Reaction Engineering	–	3
<b>CHBE 3300</b>	Fluid Mechanics and Heat Transfer	3	–
<b>CHBE 3350</b>	Mass Transfer and Rate-Based Separations	–	3
<b>CHBE 3600</b>	Chemical Process Control	–	3
<b>CHBE 3900W</b>	Chemical Engineering Laboratory I	–	4
	Science Elective: CHEM 3300 (preferred), BSCI 2201, or BSCI 2520	3	–
	Liberal Arts Core	3	3
		<hr/>	<hr/>
		15	16

SENIOR YEAR		Semester hours	
		FALL	SPRING
<b>CHBE 4900W</b>	Chemical Engineering Laboratory II	3	–
<b>CHBE 4950W</b>	Chemical Engineering Process and Product Design	4	–
<b>CHBE 4951W</b>	Chemical Engineering Design Projects	–	3
<b>CHBE 4959</b>	Senior Engineering Design Seminar	1	–
	Chemical and Biomolecular Engineering Elective	3	3
	Liberal Arts Core	–	3
	Technical Elective	3	3
	Open Elective	3	4
		17	16

**Specimen curricula for the double majors with biomedical engineering and with chemistry can be found on the department's website.**

**Course descriptions begin on page 320.**

## Civil Engineering

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 ASSOCIATE CHAIR Florence Sanchez  
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 James H. Clarke (Environmental Engineering)  
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 Camp, Andrew G. Garrabrants  
 ASSISTANT PROFESSORS Hiba Baroud, Ravindra Duddu, Shihong Lin  
 ASSISTANT PROFESSOR OF THE PRACTICE Mazita Mohd Tahir  
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 Croff, James P. Dobbins, Vic L. McConnell, L. Hampton Turner IV,  
 Hans A. Van der Sloot, Raymond G. Wymer

VANDERBILT'S Department of Civil and Environmental Engineering offers a broad-based education in civil and environmental engineering fundamentals, coupled with development of leadership, management, and communications skills to establish a foundation for lifelong learning and flexible career development. This goal requires going beyond technical competence in a balanced education to develop future leaders in the fields of consulting, industry, business, law, government, and research. Civil engineers must be able to face complex problems of modern society involving the development of physical facilities that serve the public while protecting the environment and preserving social values. Challenges facing civil and environmental engineers concern housing, urban transportation, pollution control, water resources development, industrial development, maintaining and advancing our nation's aging infrastructure, and exploring space. Addressing

these challenges with today's limited resources requires innovative and original ideas from highly-skilled engineers.

Undergraduates majoring in civil engineering receive a strong background in mathematics, science, engineering design, and engineering design. The program also includes courses in economics, humanities, social sciences, resources management, and public policy. Students participate in design teams and laboratory studies as well as classroom activities. Use of various computer-based methods is integral to problem solving and design.

*Degree Programs.* At the undergraduate level, the Department of Civil and Environmental Engineering offers the B.E. in civil engineering. The curriculum includes upper-level analysis and design courses in structural, geotechnical, environmental, water resources, and transportation engineering. In addition, a major in chemical engineering with a minor in environmental engineering is available.

Vanderbilt's B.E. in civil engineering prepares students for entry-level positions in many specialty areas of civil engineering, as well as many other types of careers, such as business, construction, and law. Today, however, and even more so in the future, professional practice at a high level will require an advanced degree. We recommend that students seriously consider pursuing the M.S. or M. Eng. soon after obtaining the B.E.

At the graduate level, the department educates leaders in infrastructure and environmental engineering research and practice, with emphasis on the use of reliability and risk management. Reliability and risk management includes engineering design, uncertainty analysis, construction and repair, life-cycle and cost-benefit analysis, information management, and fundamental phenomena intrinsic to the understanding of advanced infrastructure and environmental systems. Example applications include performance, reliability and safety of structures, restoration of contaminated sites, transportation control systems, management of environmental resources, and enhancement of the eco-compatibility of industry. Development and application of advanced information systems as applied to civil and environmental engineering needs is an important part of the program.

The graduate program in civil engineering offers the M.S. and Ph.D., with emphasis in the areas of structural engineering and mechanics and transportation engineering.

The graduate program in environmental engineering offers the M.S. and Ph.D. in the areas of environmental engineering

and environmental science, with emphasis on contaminant behavior in the environment, waste management, nuclear environmental engineering, and environmental remediation. Both thesis and non-thesis options are available at the M.S. level.

The graduate programs in both civil engineering and environmental engineering also offer the master of engineering (M.Eng.), an advanced professional degree especially designed for practicing engineers wanting to pursue post-baccalaureate study on a part-time basis, and for engineers seeking greater emphasis on engineering design as part of graduate education.

**B.E./M.Eng. Five Year Program.** Students seeking advanced study in civil and environmental engineering may be interested in the combined B.E./M.Eng., enabling students to complete the B.E. in civil engineering and M.Eng. in civil engineering or environmental engineering in five years.

**Construction Management Five Year Program.** Students seeking advanced study in construction management may be particularly interested in the combined B.E./M.Eng., enabling students to complete the B.E. in civil engineering and M.Eng. in civil engineering (construction management emphasis) in five years.

**Undergraduate Honors Program.** Recognized with the diploma designation Honors in Civil Engineering, exceptional students may be invited in their junior year to participate in the civil engineering Honors Program. Designed as a unique individualized educational experience, participants work closely with departmental faculty members to tailor a selection of courses that actively immerses them in a selected field of study. Experiences include enrollment in a 3 semester hour independent study course and participation in a summer research internship. Honors Program participants are especially well-prepared to enter graduate study, and they may count the independent study course towards their civil engineering technical electives.

**Facilities.** The civil engineering laboratory provides for static and dynamic testing of materials and structural components and assemblies. Testing facilities include capabilities of testing composites, metals, and concrete under static loads, fatigue, base acceleration (to simulate seismic events) and intermediate to high speed impacts (to simulate responses to blast events). Full soils testing facilities are available. Hydraulics facilities include several model flow systems to illustrate principles of fluid mechanics and hydrology. The transportation laboratory is computer-based, with emphasis on transportation systems and design, intelligent transportation systems, and geographic information systems.

The newly renovated environmental laboratories are fully supplied with modern instrumentation for chemical, physical, biological, and radiological analysis of soils, sediments, water, wastewater, air, and solid waste. They include equipment for the study of biological waste treatment, physical-chemical waste treatment, contaminant mass transfer, and state-of-the-art instrumentation for gas and liquid chromatography, mass spectroscopy, atomic absorption spectroscopy, gamma spectroscopy, inductively coupled plasma mass spectroscopy, gas adsorption (for pore structure determination), thermal mechanical analysis, modulated scanning differential calorimetry, and simultaneous thermal gravimetric analysis differential scanning calorimetry/mass spectroscopy. All are available for student use in courses, demonstrations, and research.

## Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.E. in civil engineering requires a minimum of 125 hours, distributed as follows:

1. Mathematics (14 hours). Required courses: MATH 1300, 1301, 2300, 2420.
2. Basic science (12 hours). Required courses: CHEM 1601/1601L; PHYS 1601/1601L, 1602/1602L.
3. Basic science elective (4 hours). To be selected from: (a) Biological Sciences courses numbered 1510 and above; (b) Earth and Environmental Sciences 1030, 1030L, 1510, 1510L, 3250, 3260, 3330, 3340; and (c) Materials Science and Engineering courses except MSE 3850, 3851, 3889, 3890.
4. Computing (3 hours). Required course: CS 1101 or CS 1103.
5. Engineering Fundamentals (26 hours). Required courses: ES 1401, 1402, 1403; CE 2101, 2200, 2205, 3700, 3700L; ENGM 2160; ME 2190; MSE 2205; ME 2220 or CHBE 2200 (students with interests in Environmental and Infrastructure Sustainability Engineering are encouraged to enroll in CHBE 2200).
6. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed under Degree Programs in Engineering.
7. Open electives (6 hours).
8. Technical electives (3 hours). To be selected from: (a) all courses in BME, CHBE, CE, ENVE, EECE, ME, and ENGM 3000, 3010, 3200, 3650; (b) all courses acceptable as science electives as indicated above; (c) CHEM 1602 and above; (d) PHYS courses above 2000 (astronomy not accepted); and (e) MATH 2410 or MATH 2600, and courses 2811 and above (except 3000). Students with an interest in Structural Engineering are encouraged to take MATH 2410 or MATH 2600 as their technical elective.
9. Civil Engineering Core (27 hours). Required courses: CE 2120, 3100W, 3200, 3205, 3300, 3501, 3705, 4400, 4950, 4951, and 4959.
10. Civil Engineering Program Electives (6 hours). To be selected from: CE 3250, CE 3600, CE 4250, or ENVE 4615.
11. Civil Engineering Design Electives (6 hours). To be selected from: CE 4150, 4200, 4210, 4240, 4250, 4425, 4430, 4500, 4505, 4510; ENVE 4305, 4610, 4710, 4716; CHBE 4899.

Students may use CE program electives, CE design electives, technical electives, and open electives to gain additional depth and expertise. Students with interests in structural engineering are recommended to take electives such as CE 3250, 4200, 4210, 4211, 4250, 4300, ENVE 4305, and ME 4259, 4275. Students interested in environmental and infrastructure sustainability engineering are recommended to take electives such as CE 3600, 4100, 4150, 4240, 4300, ENVE 4305, 4600, 4605, 4610, 4615, 4620, 4700, 4705, 4707, 4710, 4715, 4716, 4720, and CHBE 4899. Specific courses selections should be discussed with their academic adviser. Students desiring advanced topic coverage should also consider 5000-level courses, with approval of their adviser.

Undergraduates in civil engineering may apply the pass/fail option only to courses taken toward satisfying the liberal arts core, subject to the school requirements for pass/fail.

## Specimen Curriculum for Civil Engineering

		Semester hours	
SOPHOMORE YEAR		FALL	SPRING
<b>MATH 2300</b>	Multivariable Calculus	3	–
<b>PHYS 1602</b>	General Physics II	3	–
<b>PHYS 1602L</b>	General Physics Laboratory II	1	–
<b>CE 2101</b>	Civil and Environmental Engineering Information Systems	3	–
<b>CE 2120</b>	Sustainable Design in Civil Engineering	3	–
<b>CE 2200</b>	Statics	3	–
<b>MATH 2420</b>	Methods of Ordinary Differential Equations	–	3
<b>CE 2205</b>	Mechanics of Materials	–	3
<b>CE 3501</b>	Transportation Systems Engineering	–	3
<b>ME 2190</b>	Dynamics	–	3
	Thermodynamics (ME 2220 or CHBE 2200)	–	3
	Liberal Arts Core	–	3
		16	18
JUNIOR YEAR			
<b>CE 3200</b>	Structural Analysis	3	–
<b>CE 3700</b>	Fluid Mechanics	3	–
<b>CE 3700L</b>	Fluid Mechanics Laboratory	1	–
<b>MSE 2205</b>	Strength and Structure of Engineering Materials	1	–
	CE Program Elective	3	–
	Elective*	3	–
	Liberal Arts Core	3	3
<b>CE 3100W</b>	Civil and Environmental Engineering Laboratory	–	2
<b>CE 3205</b>	Structural Design	–	3
<b>CE 3300</b>	Risk, Reliability, and Resilience Engineering	–	3
<b>CE 3705</b>	Water Resources Engineering	–	3
<b>ENGM 2160</b>	Engineering Economy	–	3
		17	17
SENIOR YEAR			
<b>CE 4400</b>	Construction Project Management	3	–
<b>CE 4950</b>	Civil Engineering Design I	1	–
<b>CE 4959</b>	Senior Engineering Design Seminar	1	–
	CE Design Elective	3	3
	Elective*	3	3
	Liberal Arts Core	3	3
<b>CE 4951</b>	Civil Engineering Design II	–	2
	Open Elective	–	3
		14	14

\*To be selected toward satisfying the following degree requirements: 6 hours of Program Electives, 3 hours of Technical Electives, and 6 hours of Open Electives.

## Pre-Architecture Program

Civil engineering students interested in pursuing architecture at the graduate level should include courses that emphasize a broad sense of art and architectural history, including courses in studio art. Before applying to graduate programs, students will need to develop a portfolio of creative work that generally includes drawing, prints, sculpture, photographs, and creative writing. Professor Michael Aurbach in the Department of Art serves as the pre-architecture adviser to Vanderbilt students. In addition, the Vanderbilt student club, BLUEprint, seeks to educate and prepare students interested in this field.

## Minor in Environmental Engineering

A minor in environmental engineering is available to all non-civil engineering students. It requires a total of 15 hours of environmental engineering courses, comprising 6 hours of required courses and 9 hours of electives, chosen from the following list:

Required Courses (6 hours)

CE 3600 – Environmental Engineering  
ENVE 4600 – Environmental Chemistry

Elective Courses (9 hours)

CE 3705 – Water Resources Engineering  
CE 4100 – Geographic Information Systems  
CHBE 4899 – Atmospheric Pollution  
ENVE 4305 – Enterprise Risk Management  
ENVE 4605 – Environmental Thermodynamics, Kinetics, and Mass Transfer  
ENVE 4610 – Biological Processes in Environmental Systems  
ENVE 4615 – Environmental Assessments  
ENVE 4620 – Environmental Characterization and Analysis  
ENVE 4625 – Environmental Separations Processes  
ENVE 4700 – Energy and Water Resources  
ENVE 4705 – Physical Hydrology  
ENVE 4710 – Hydrology  
ENVE 4715 – Groundwater Hydrology  
ENVE 4720 – Surface Water Quality Modeling  
ENVE 4800 – Introduction to Nuclear Environmental Engineering

## Minor in Energy and Environmental Systems

The minor in energy and environmental systems is designed to provide students with a working knowledge of the fundamentals of energy systems and their impact on the environment. The future health and well-being of humanity hinge in large part on smart production and use of energy, water, and related resources, as these are central determinants of climate change, habitable space, and human and ecological health. This program examines the relationships among individual, institutional, and societal choices for energy production and use, and the impacts and benefits of these choices on the environment and health through climate, water quality, and natural resources. It requires a total of 15 semester hours of course work, some of which may be taken as electives associated with the student's major program. Five courses are required: two core courses and three elective courses distributed among three areas (at least one course from each of two areas): Area I: Energy Systems, Area II: Environmental Engineering, and Area III: Environmental Survey.

Required Courses (6 hours)

ENVE 4615 – Environmental Assessments  
ENVE 4700 – Energy and Water Resources

Elective Courses (9 hours)

*Area I: Energy Systems*

EECE 4267 – Power System Analysis  
ME 3890 – Special Topics: Nuclear Power  
ME 4260 – Energy Conversion I

ME 4264 – Internal Combustion Engines

ME 4265 – Direct Energy Conversion

*Area II: Environmental Engineering*

CE 3600 – Environmental Engineering  
CE 3705 – Water Resources Engineering  
CHBE 4899 – Atmospheric Pollution  
ENVE 4305 – Enterprise Risk Management  
ENVE 4605 – Environmental Thermodynamics, Kinetics, and Mass Transfer  
ENVE 4620 – Environmental Characterization and Analysis  
ENVE 4710 – Hydrology  
ENVE 4800 – Introduction to Nuclear Environmental Engineering  
ME 4262 – Environmental Control

*Area III: Environmental Survey*

ANTH 4154 – Energy, Environment, and Culture  
CE 4100 – Geographic Information Systems  
CE 4430 – Building Systems and LEED  
EES 1080 – Earth and the Atmosphere  
EES 2110 – Global Change and Global Issues  
PHIL 3611 – Environmental Philosophy  
SOC 3315 – Human Ecology and Society

## Minor in Engineering Management

A minor in engineering management is available to all students in civil engineering. This program provides students with a working knowledge of the fundamentals of business and engineering management. It requires a minimum of 15 semester hours of course work, some of which may be taken as electives associated with the student's major program. Five courses are required: four core courses and the remaining course chosen from a list of electives. A detailed description of the engineering management minor is available in this catalog.

## Study Abroad

Civil engineering students can participate in the Vanderbilt Study Abroad programs (see description of the Study Abroad programs in this catalog). Civil engineering students often participate during the fall semester of their junior year, but students may study abroad in either the sophomore or the junior year.

## Civil Engineering

Course descriptions begin on page 322.

## Environmental Engineering

Course descriptions begin on page 326.

# Computer Engineering

DIRECTOR OF UNDERGRADUATE STUDIES W. Timothy Holman  
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ASSISTANT PROFESSORS Abhishek Dubey, Taylor Johnson, Yevgeniy Vorobeychik, Jules White  
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THE program in computer engineering deals with the organization, design, and application of digital processing systems as general-purpose computers or as embedded systems, i.e., components of information processing, control, and communication systems. The program provides a strong engineering background centered on digital technology combined with an understanding of the principles and techniques of computer science. Computer engineering is design-oriented. The basic principles of engineering and computer science are applied to the task at hand, which may be the design of a digital processor, processor peripheral, or a complete digital processor-based system. Whatever the undertaking, the comprehensive academic training in this program enables engineers to evaluate the impact of their decisions, whether working with hardware, software, or the interface between the two.

The computer engineering program combines fundamental core requirements with flexibility to allow students to specialize in a variety of emphasis areas within the program. The curriculum includes requirements in the basic sciences, mathematics, and humanities; a primary core of hardware and software courses; and a set of electives that combine breadth and depth requirements as described below. Students who major in computer engineering who wish to apply for graduate study in electrical engineering or computer science are encouraged strongly to select their elective courses to demonstrate depth in that particular area; the structure of the program enables that option. The course of study leads to a bachelor of engineering.

*Undergraduate Honors Program.* With faculty approval, junior and senior students may be accepted into the Honors Program. To achieve honors status, the student must:

1. achieve and maintain a minimum GPA of 3.5.
2. choose 6 hours of EE/CMPE program elective credit from among the following list:
  - a. research-based independent study credit, or
  - b. design domain expertise (DE) courses beyond the one course required by the program, or
  - c. 5000-level courses.

3. complete 3 hours of research-based independent study credit (with final written report) in addition to all other requirements.

The diploma designation is Honors in Computer Engineering.

### Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.E. in computer engineering requires a minimum of 127 hours distributed as follows:

1. Mathematics (18 hours). Required courses: MATH 1300, 1301, 2300, 2400, 2810
2. Basic Science (16 hours). Required courses: CHEM 1601/1601L; PHYS 1601/1601L, 1602/1602L; MSE 1500/ 1500L (or CHEM 1602/1602L).
3. Engineering Fundamentals (6 hours). Required courses: ES 1401, 1402, 1403, 2100W.
4. Culminating Design Experience (7 hours). Required courses: EECE 4950, 4951, 4959.
5. Computer Engineering Core (at least 26 hours). Required courses: EECE 2112, 2116/2116L, 2218/2218L and either 2213/2213L or 3214; CS 1101, 2201, 2231, and 3251.
6. Computer Engineering Electives (18 hours). Defined by a structure that includes the three Computer Engineering Areas of Concentration listed below. Students must complete at least two courses in each of two areas of concentration. Embedded Systems (Area 1) must include EECE 4376, Computing Systems and Networks (Area 2) must include CS 3281 and Intelligent Systems and Robotics (Area 3) must include EECE 4257. Students must complete at least one approved design domain expertise (DE) course as designated below. Other electives from any of the Areas of Concentration or approved independent study (CS 3860-3861; EECE 3850-3851) to total 18 hours.

## Computer Engineering Areas of Concentration

### Embedded Systems

EECE 4257  
 EECE 4275  
 EECE 4356 (DE)  
 EECE 4358 (DE)  
 EECE 4376 (DE)  
 EECE 4377 (DE)  
 EECE 4385 (DE)  
 CS 3274 (DE)

### Computing Systems and Networks

CS 3265  
 CS 3274 (DE)  
 CS 3281  
 CS 3282 (DE)  
 CS 4266 (DE)  
 CS 4278 (DE)  
 CS 4279 (DE)  
 CS 4283 (DE)  
 CS 4284 (DE)  
 CS 4285  
 CS 4288 (DE)  
 EECE 4371 (DE)

### Intelligent Systems and Robotics

CS 4260  
 CS 4269 (DE)  
 EECE 4257  
 EECE 4353 (DE)  
 EECE 4354 (DE)  
 EECE 4358 (DE)  
 ME 4271

- 7. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
- 8. Technical electives (15 hours).
  - a. (6-15 hours). At least 6 hours must be taken from this list of approved engineering technical electives.
    - BME (except 2201, 3860, 3861)
    - CHBE
    - CE
    - CS (except 1103, 1151)
    - EECE (hours above basic requirement in sections 5 and 6 above)
    - ENGM 3010
    - ME
    - MSE (except 1500, 1500L)
    - NANO 3000
    - SC 3250, 3260

b. (0-9 hours). Up to 9 hours may be taken from this list of optional technical electives.

- ENGM 2160, 2210, 3000, 3100, 3300, 3650, 4500
- MSE 1500, 1500L (if CHEM 1602, 1602L is used for basic science requirement)
- Astronomy (except 1010, 1111, 2130)
- Biological Sciences (except 1111)
- Chemistry (except 1010, 1020, 1601, 1602, 1111)
- Earth and Environmental Sciences (except 1080, 1111, 2150)
- Mathematics 2410 and above
- Neuroscience 2201, 3269, 4961
- Physics above 2000
- Psychology 2100, 3780

9. Open Elective (3 hours).

Undergraduates in computer engineering may apply the pass/fail option only to courses taken as open electives subject to the school requirements for pass/fail.

### Specimen Curriculum for Computer Engineering

		Semester hours	
		FALL	SPRING
FRESHMAN YEAR			
<b>EECE 2116/2116L†</b>	Digital Logic	–	4
<b>CS 1101</b>	Programming and Problem Solving	–	3
	Other freshman courses (see the engineering freshman-year specimen curriculum)	14	8
		—	—
		14	15
SOPHOMORE YEAR			
<b>MATH 2300</b>	Multivariable Calculus	3	–
<b>MATH 2400</b>	Differential Equations with Linear Algebra	–	4
<b>PHYS 1602</b>	General Physics II	3	–
<b>PHYS 1602L</b>	General Physics Laboratory II	1	–
<b>MSE 1500 †</b>	Materials Science I	–	3
<b>MSE 1500L †</b>	Materials Science Laboratory	–	1
<b>EECE 2112</b>	Circuits I	3	–
<b>EECE 2218/2218L</b>	Microcontrollers	–	4
<b>CS 2201</b>	Program Design and Data Structures	3	–
<b>CS 2231</b>	Computer Organization	–	3
<b>CS 3251</b>	Intermediate Software Design	–	3
	Liberal Arts Core	3	–
		—	—
		16	18
JUNIOR YEAR			
<b>MATH 2810</b>	Probability and Statistics for Engineering	–	3
<b>ES 2100W</b>	Technical Communications	3	–
<b>EECE 4376/4376L</b>	Embedded Systems	–	–
<b>or CS 3281</b>	Principles of Operating Systems I	4/3	–
<b>EECE 2213/2213L</b>	Circuits II	–	–
<b>or EECE 3214</b>	Signals and Systems	4/3	–
	CMPE Program Elective ‡	3	6
	Liberal Arts Core	3	3
	Technical Electives	–	6
		—	—
		15-17	18



## SENIOR YEAR

<b>EECE 4950</b>	Program and Project Management for EECE	3	–
<b>EECE 4951</b>	Electrical and Computer Engineering Design	–	3
<b>EECE 4959</b>	Senior Engineering Design Seminar	1	–
	CMPE Program Electives ‡	3	3
	Liberal Arts Core	3	3
	Technical Electives	6	3
	Open Electives	–	3
		16	15

† Computer engineering majors are encouraged to take EECE 2116/2116L in the spring of their freshman year in lieu of MSE 1500/1500L. MSE 1500/1500L may be taken in the sophomore year.

‡ As described in “Computer Engineering Degree Requirements” subsection 6. At least one design domain expertise (DE) course required prior to EECE 4951.

## Computer Science

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ASSISTANT PROFESSORS OF THE PRACTICE Graham S. Hemingway, Robert Tairas

ADJUNCT ASSISTANT PROFESSORS Daniel Balasubramanian, William R. Otte, Zhiao Shi

THE program in computer science blends scientific and engineering principles, theoretical analysis, and actual computing experience to provide undergraduate students with a solid foundation in the discipline. Emphasis is on computing activities of both practical and intellectual interest, and on theoretical studies of efficient algorithms and the limits of computation. Computer facilities are available for class assignments, team projects, and individual studies. Students are challenged to seek original insights throughout their study. Working in teams, participating in summer internships, supporting student professional organizations, and developing interdisciplinary projects are strongly encouraged.

The computer science major provides an excellent background for medical studies, and the flexibility provided by its many open electives allows students to prepare for medical school while earning a degree in computer science with a normal load in four years. Interested students should discuss their plans with their computer science adviser in the fall of their first year.

In addition to the bachelor of science, the master of science and doctor of philosophy are also awarded in computer science. Many students choose to double major in mathematics.

*Undergraduate Honors Program.* The Honors Program provides recognition for select undergraduates who have experienced advanced study in computer science. Students who have an overall GPA of 3.5 or better, a GPA of 3.5 or better in computer science classes, and six hours of any combination of undergraduate research (CS 3860 and 3861) and 6000-level courses will be granted honors in the computer science program. The diploma designation is Honors in Computer Science.

### Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.S. in computer science requires a minimum of 120 hours, distributed as follows:

1. Mathematics (20–22 hours). Required components:

(a) A calculus sequence (11–16 hours).

Selected from the following:

MATH 1200, 1201, 2200, 2300

MATH 1300, 1301, 2300

MATH 1300, 1301, 2500, 2501

(b) Linear algebra (3–4 hours): MATH 2410, 2501, or 2600.

(c) Statistics/Probability (3 hours): MATH 2810, 2820, or 3640.

(d) Elective course (3 hours):

Selected from: MATH 2420 or courses numbered 2610 or higher.

2. Science (12 hours). To be selected from the following list and include at least one laboratory course: BSCI 1100, 1100L, 1510, 1510L, 1511, 1511L, 2218, 2219; CHEM 1601, 1601L, 1602, 1602L; Earth and Environmental Sciences 1510, 1510L; MSE 1500, 1500L; PHYS 1601, 1601L, 1602, 1602L. Recommended: CHEM 1601, 1601L; PHYS 1601, 1602.

3. Introduction to Engineering (3 hours): ES 1401, 1402, 1403.

4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.

5. Computer Science Core (28 hours).

Software/Problem Solving: CS 1101, 2201, 3251, 3270.

Hardware/Systems: EECE 2116, 2116L; CS 2231, 3281.

Foundations: CS 2212, 3250.



6. Computer Science Depth (12 hours). To be selected from computer science courses numbered 3000 or higher; EECE 4353, 4354, 4376 and no more than two of the following courses: MATH 3320, 3620, 4600, 4620. At least one course (i.e., 3 hours) must be a designated project course selected from CS 3259, 4269, 4279.
7. Computer Science Project Seminar (1 hour) CS 4959.
8. Technical Electives (6 hours). To be selected from courses numbered 2000 or higher within the School of Engineering (except ENGM 2440, ENGM 4800, ES 2700, and CS courses numbered below 3000); or courses numbered 2000 or higher in the College of Arts and Science listed in the mathematics and natural science (MNS) AXLE distribution requirements. Students are encouraged to note the two-course sequence EECE 4950-4951.
9. Open Electives (18–20 hours).
10. Computers and Ethics (3 hours) CS 1151. May be used to satisfy three hours from the Liberal Arts Core (#4) or Open Electives (#9).
11. Writing Component. At least one “W”-designated course or 1111 course in the English Language must be included from the Liberal Arts Core (#4) or Open Electives (#9).

Undergraduates in computer science may apply the pass/fail option only to courses taken as open electives, technical electives, or part of the liberal arts core, subject to the school requirements for pass/fail.

## Specimen Curriculum for Computer Science

		Semester hours	
		FALL	SPRING
FRESHMAN YEAR			
<b>CHEM 1601</b>	General Chemistry	3	–
<b>CHEM 1601L</b>	General Chemistry Laboratory	1	–
<b>PHYS 1601</b>	General Physics I	–	3
<b>PHYS 1601L</b>	General Physics Laboratory I	–	1
<b>MATH 1300</b>	Accelerated Single-Variable Calculus I	4	–
<b>MATH 1301</b>	Accelerated Single-Variable Calculus II	–	4
<b>ES 1401-1403</b>	Introduction to Engineering	3	–
<b>CS 1101</b>	Programming and Problem Solving	–	3
	Open Electives	3	–
	Liberal Arts Core	–	3
		14	14
SOPHOMORE YEAR			
<b>PHYS 1602</b>	General Physics II	3	–
<b>PHYS 1602L</b>	General Physics Laboratory II	1	–
<b>MATH 2300</b>	Multivariable Calculus	–	3
<b>EECE 2116/2116L</b>	Digital Logic	4	–
<b>CS 2201</b>	Program Design and Data Structures	3	–
<b>CS 2212</b>	Discrete Structures	–	3
<b>CS 2231</b>	Computer Organization	–	3
<b>CS 3251</b>	Intermediate Software Design	–	3
	Liberal Arts Core	–	3
	Open Elective	3	–
		14	15
JUNIOR YEAR			
<b>MATH 2410</b>	Methods of Linear Algebra	–	3
<b>MATH 2820</b>	Introduction to Probability and Mathematical Statistics	3	–
<b>ES 2100W</b>	Technical Communications	3	–
<b>CS 3250</b>	Algorithms	–	3
<b>CS 3270</b>	Programming Languages	3	–
<b>CS 3281</b>	Principles of Operating Systems I	3	–
	CS Depth	–	3
	Open Electives	5	3
	Liberal Arts Core	–	3
		17	15

SENIOR YEAR		Semester hours	
		FALL	SPRING
<b>CS 4959</b>	Computer Science Project Seminar	1	–
	Computer Science Project	–	3
	Mathematics Elective	3	–
	CS Depth/Technical Elective	6	6
	Liberal Arts Core	3	3
	Open Electives	3	3
		16	15

## Second Major in Computer Science for Non-Engineering Students

The second major in computer science for students enrolled outside the School of Engineering requires 40 hours distributed according to items 5 and 6 of the curriculum requirements listed above.

Courses taken toward the second major may not be taken pass/fail.

### Computer Science Minor

The minor in computer science requires 15 hours of computer science courses as follows:

1. Programming: CS 1101 3
  2. Discrete Structures: CS 2212 3
  3. Intermediate Computer Concepts: CS 2201 3
  4. One of CS 2231, CS 3250, or CS 3251 3
  5. One additional CS course numbered 3000 or above 3
- Total hours: 15

Course descriptions begin on page 328.

# Electrical Engineering

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THE electrical engineer has been primarily responsible for the information technology revolution that society is experiencing. The development of large-scale integrated circuits has led to the development of computers and networks of ever-increasing capabilities. Computers greatly influence the methods used by engineers for designing and problem solving.

The curricula of the electrical engineering and computer engineering majors are multifaceted. They provide a broad foundation in mathematics, physics, and computer science and a traditional background in circuit analysis and electronics. Several exciting areas of concentration are available, including microelectronics, computer systems, robotics and control systems, and signal processing. Double majors may be arranged with some programs, including biomedical engineering and mathematics. Students receive an education that prepares them for diverse careers in industry and government and for post-graduate education.

*Undergraduate Honors Program.* With faculty approval, junior and senior students may be accepted into the Honors Program. To achieve honors status, the student must:

1. achieve and maintain a minimum GPA of 3.5.
2. choose 6 hours of EE/CMPE program elective credit from among the following list:
  - a. research-based independent study credit, or
  - b. design domain expertise (DE) courses beyond the one course required by the program, or
  - c. 5000-level courses.
3. complete 3 hours of research-based independent study credit (with final written report) in addition to all other requirements.

The diploma designation is Honors in Electrical Engineering.

*Facilities.* Electrical and computer engineering supports undergraduate laboratories emphasizing the principal areas of the disciplines: analog and digital electronics, microcomputers, microprocessors, microelectronics, and instrumentation. In addition, several specialized facilities are available for graduate research: the advanced carbon nanotechnology and diamond labs, the Institute for Software Integrated Systems, the Institute for Space and Defense Electronics, the Medical Image Processing Laboratory, the Center for Intelligent Systems and Robotics Laboratories, the Embedded Computer Systems Laboratory, and biomedical, biosensing, and photonics laboratories.

The work in electrical and computer engineering is supported by a variety of computers and networks, including the high-performance computing facilities of the Advanced Computing Center for Research and Education. Vanderbilt is one of the founding partners in the Internet II initiative.

## Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.E. in electrical engineering requires a minimum of 128 hours distributed as follows:

1. Mathematics (18 hours). Required courses: MATH 1300, 1301, 2300, 2400, 2810.
2. Basic Science (16 hours). Required courses: CHEM 1601/1601L; PHYS 1601/1601L, 1602/1602L; MSE 1500/1500L (or CHEM 1602/1602L for some double majors).
3. Engineering Fundamentals (6 hours). Required courses: ES 1401, 1402, 1403, ES 2100W.
4. Culminating Design Experience (7 hours). Required courses: EECE 4950, 4951, 4959.
5. Electrical Engineering Core (24 hours). Required courses: CS 1101 or 1103; EECE 2112, 2116/2116L, 2213/2213L, 3214, 3233, 3235/3235L.
6. Electrical Engineering Electives (18 hours). Defined by a structure that includes the five Electrical Engineering Areas of Concentration listed below. Students must complete at least two courses in each of two concentration areas. Students must complete at least one approved design domain expertise (DE) course as designated below. Other EECE electives to total 18 hours.

## Electrical Engineering Areas of Concentration

Computer Engr.	Microelectronics	Signal/Image Processing	Robotics	Networking and Comm.
EECE 2218	EECE 4275	EECE 4252	EECE 4257	EECE 4252
EECE 4275	EECE 4283	EECE 4286	EECE 4354 (DE)	EECE 4371 (DE)
EECE 4356 (DE)	EECE 4284	EECE 4353 (DE)	EECE 4358 (DE)	
EECE 4376 (DE)	EECE 4288	EECE 4354 (DE)	ME 4271	
EECE 4377 (DE)	EECE 4380 (DE)	EECE 4356 (DE)		
EECE 4385 (DE)	EECE 4385 (DE)	CS 3258		
CS 3274 (DE)	BME 3300	BME 3300		
ME 4271		BME 3600		

(DE) designates a Design Domain Expertise course

7. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.

8. Technical electives (18 hours).

a. (9–18 hours). At least 9 hours must be taken from this list of approved engineering technical electives.

BME (except 2201, 3860, 3861)

CHBE

CE

CS (except 1101, 1103, 1151)

EECE (above basic requirement in sections 5 and 6 above)

ENGM 3010

ME

MSE (except 1500, 1500L)

NANO 3000

SC 3250, 3260

b. (0–9 hours). Up to 9 hours may be taken from this list of optional technical electives.

ENGM 2160, 2210, 3000, 3100, 3300, 3650, 4500

MSE 1500, 1500L (if CHEM 1602, 1602L is used for basic science requirement)

Astronomy (except 1010, 1111, 2130)

Biological Sciences (except 1111)

Chemistry (except 1010, 1020, 1601, 1602, 1111)

Earth and Environmental Sciences (except 1080, 1111, 2150)

Mathematics 2410 and above

Neuroscience 2201, 3269, 4961

Physics above 2000

Psychology 2100, 3780

9. Open Elective (3 hours).

Double majors have special curricula that require more than 128 hours and a different distribution of electives. See the EECS webpage or the EECE double major adviser for these curricula.

A double major in electrical engineering and biomedical engineering is offered as a unitary BME-EE curriculum, which is described in the Biomedical Engineering section of the catalog under its curriculum requirements. It requires a minimum of 129 semester hours.

Undergraduates in electrical engineering, including double majors in electrical engineering, may apply the pass/fail option only to courses taken as open electives subject to the school requirements for pass/fail.

## Specimen Curriculum for Electrical Engineering

		Semester hours	
		FALL	SPRING
FRESHMAN YEAR †			
<b>EECE 2116 /2116L†</b>	Digital Logic	–	4
	Other freshman courses (see the engineering freshman-year specimen curriculum)	14	12
		14	16
SOPHOMORE YEAR			
<b>MATH 2300</b>	Multivariable Calculus	3	–
<b>MATH 2400</b>	Differential Equations with Linear Algebra	–	4
<b>PHYS 1602</b>	General Physics II	3	–
<b>PHYS 1602L</b>	General Physics Laboratory II	1	–
<b>CS 1101 or 1103 †</b>	Programming and Problem Solving	3	–
<b>EECE 2112</b>	Circuits I	3	–
<b>EECE 2213/2213L</b>	Circuits II	–	4
	Liberal Arts Core	3	3
	Technical Electives	–	6
		16	17
JUNIOR YEAR			
<b>MATH 2810</b>	Probability and Statistics for Engineering	–	3
<b>ES 2100W</b>	Technical Communications	–	3
<b>EECE 3214</b>	Signals and Systems	3	–
<b>EECE 3233</b>	Electromagnetics	3	–
<b>EECE 3235/3235L</b>	Electronics I	4	–
	EE Program Electives ‡	–	9
	Liberal Arts Core	3	3
	Technical Elective	3	–
		16	18
SENIOR YEAR			
<b>EECE 4950</b>	Program and Project Management for EECE	3	–
<b>EECE 4951</b>	Electrical and Computer Engineering Design	–	3
<b>EECE 4959</b>	Senior Engineering Design Seminar	1	–
	EE Program Electives ‡	6	3
	Liberal Arts Core	–	3
	Technical Electives	6	3
	Open elective	–	3
		16	15

† Electrical engineering majors are encouraged to take EECE 2116 and EECE 2116L in the spring of their freshman year in lieu of CS 1101 or 1103, which may be taken in the sophomore year. CS 1101 is recommended over CS 1103 for electrical engineering majors; those who plan double majors should see their advisers.

‡ As described in Electrical Engineering Degree Requirements subsection 6. At least one design domain expertise (DE) course required prior to EECE 4951.

**Course descriptions begin on page 332.**

# General Engineering

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THE Division of General Engineering administers the engineering science major, the engineering management minor, and the first-year introduction to engineering course. The division oversees non-traditional engineering study and advises students on course selection to meet specific career goals that traditional engineering majors may not provide.

## Engineering Science Major (Bachelor of Science)

The engineering science major is flexible and interdisciplinary—offering students the opportunity to select a program of study to meet special interests or objectives. Many students choose a program of study in engineering management, communication of science and technology, various engineering concentrations, environmental science or materials science; however, students may develop unique plans of study to specialize in areas for which facilities and faculty competence exist but which are not covered within a single existing degree program at Vanderbilt. Engineering science graduates may establish careers in engineering or science, interface with engineers (e.g., in marketing and sales), or use their analytical and problem-solving skills to build future professional careers. Defined areas of concentration exist in engineering management, communication of science and technology, secondary education, and materials science and engineering. Individual programs have been developed for students interested in careers in engineering mathematics, environmental engineering, transportation engineering, teaching, technical communications, and other areas requiring nontraditional combinations of engineering courses. Because of the flexible nature of the engineering science programs of study, accreditation has not been sought for these programs of study, and engineering science majors will not qualify for engineering licensure in most states.

*Engineering Management.* Engineering management is an interdisciplinary program of study designed to give students the tools to manage technology development and innovation, to enhance manufacturing quality and productivity in a competitive international environment, and to implement these objectives successfully in an organization. Engineering management links engineering, science, and the management disciplines. In addition to the core science and math courses required of all engineering students, topics of study include entrepreneurship, human resources management, finance in technology-based organizations, technology strategy, communications, and operations.

*Communication of Science and Technology.* Many careers that are attractive to graduates of the engineering science program require the communication of engineering and science to people who are not technically trained. The Communication of Science and Technology interdisciplinary program prepares engineering students for careers in areas such as technical consulting, high-technology marketing and sales, environmental law, and journalism. The program combines traditional

engineering and science courses with communications and humanities courses in a flexible curriculum. Engineering science majors may select from a set of program electives identified by the faculty committee of the School of Engineering and the College of Arts and Science that supervises the program.

*Minors.* Students may also pursue a minor consisting of at least five courses of at least three credit hours within a recognized area of knowledge. Minors are offered in engineering management, materials science and engineering, computer science, scientific computing, environmental engineering, energy and environmental systems, nanoscience and nanotechnology, and most disciplines within the College of Arts and Science. Students must declare their intention to pursue minors by completing forms available in the Office of Academic Services of the School of Engineering.

## Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students must complete a minimum of 120 hours. In consultation with the academic adviser, each student must identify a program concentration containing a minimum of 27 hours, not counting certain introductory-level courses, which directly contributes to meeting stated career goals. Program concentrations are approved by the academic adviser and the program director, and become part of the student's degree audit. No more than 24 credit hours of business-related course work (ENGM, FNEC, MGRL) may be applied to the ES degree program. The preparation provided by this 27-hour package, together with a solid foundation in basic engineering courses, provides the engineering science student with a strong and useful career base.

1. Basic science (16 hours). CHEM 1601 and 1601L plus 12 hours from the group BSCI 1510/1510L, 1511/1511L; CHEM 1602/1602L; PHYS 1601/1601L, 1602/1602L; or MSE 1500/1500L with two courses in a single discipline.
2. Mathematics (14 hours). Required courses (11 hours): MATH 1300, 1301, 2300. Electives (3 hours): to be selected from mathematics courses numbered 2400 and above.
3. Engineering (39 hours).
  - a) Engineering Fundamentals (12 hours): CS 1101 or 1103; ES 1401, 1402, 1403, 2100W; ENGM 3700.
  - b) Engineering Core (12 hours) to be selected from courses in any of the following disciplines: BME, CHBE, CE, CS, EECE, ENVE, MSE, ME, NANO, SC.
  - c) Engineering electives (15 hours): Any Engineering School courses, including ENGM, may be used to complete the 39-hour engineering requirement.
4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed under Degree Programs in Engineering.
5. Open Electives (6 hours).
6. Program concentration (27 hours). To be selected to provide a meaningful sequence of courses. Course work must be planned in advance and approved by the faculty adviser.

**Course descriptions begin on page 337.**

Undergraduates in engineering science may apply the pass/fail option only to courses taken as liberal arts core or open electives, subject to the school requirements for pass/fail.

## Engineering Management Minor

Engineering management is an interdisciplinary program of study designed to expose engineering students to the concepts and theories of the management of the engineering function, the critical elements of technology development and innovation, and the implementation of such ideas in manufacturing, engineering, and technology environments. Approximately two-thirds of all engineers spend a substantial portion of their professional careers as managers. In the complex, competitive world of technology-driven industry, skilled engineers who understand the essential principles of management and business have a competitive advantage.

The program in engineering management prepares students to work effectively in developing, implementing, and modifying technologies and systems. The ability to manage and administer large technical engineering and research projects and budgets will continue to challenge engineering management skills. Undergraduates interested in engineering management have two options. They may earn the B.E. in another engineering discipline with a minor in engineering management, or they may earn the B.S. in computer science or engineering science with engineering management as their area of concentration.

The engineering management minor is designed to provide a working knowledge of the fundamentals of management and innovation.

The minor program consists of 15 hours of course work, some of which may be taken as electives associated with the student's major program. Five courses are required: four core courses and the remaining course chosen from a list of electives.

### Program Requirements

The student must take the following four courses:

- ENGM 2210 Technology Strategy
- ENGM 2440 Applied Behavioral Science
- ENGM 3000 Enterprise Systems Design OR
- ENGM 3010 Systems Engineering
- ENGM 3700 Program and Project Management

The student must select one of the following courses:

- ENGM 2160 Engineering Economy
- ENGM 3100 Accounting and Finance for Engineers
- ENGM 3200 Technology Marketing
- ENGM 3300 Technology Assessment and Forecasting
- ENGM 3350 Organizational Behavior
- ENGM 3600 Technology-Based Entrepreneurship
- ENGM 3650 Operations and Supply Chain Management
- ENGM 4500 Product Development
- ENGM 4951 Engineering Management Capstone Project
- CE 4300 Reliability and Risk Case Studies
- ENVE 4305 Enterprise Risk Management

Course descriptions begin on page 335.

## Materials Science and Engineering

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MATERIALS are the limiting factor for most technological advances. The impact of materials on history is obvious, since technological progress in a given era is demarcated by the available materials. The Stone Age was followed by the Bronze Age and the Iron Age. The present period could be identified as the Silicon Age, which is only in its first century.

New materials allow for new technology and this is especially the case for the emerging field of nanoscience. As the size scale approaches nanometer dimensions, materials exhibit new and exciting physical properties. High performance metals, ceramics, polymers, semiconductors and composites are in demand throughout the engineering world and nanotechnology is proving to be the answer for many engineering problems. The U.S. National Science Foundation identified nanoscience and nanotechnology as a critical area for our future and created a national initiative to advance the processing and performance of nanomaterials. To accomplish these tasks, there is a need for specialists in materials science and engineering with an interdisciplinary background that combines engineering disciplines with the physical sciences.

The materials science and engineering program is integrated into the extensive ongoing nanotechnology research. The Vanderbilt Institute for Nanoscience and Engineering (VINSE) is at the center of this effort. Research areas include; nanofluidics, synthesis of semiconductor quantum dots, magnetic nanocrystals, nanoscale soft materials, optical properties of nanostructures, carbon nanotubes, nanodiamond devices, biological applications of nanocrystals, and molecular modeling and simulation of these nanoscale structures. This interdisciplinary research involves faculty from all of the engineering disciplines as well as faculty from chemistry, physics, and the medical school.

Two undergraduate options involving materials science and engineering are available. Students may pursue the B.S. in engineering science with materials science and engineering as their area of concentration or they may earn the B.E. in another engineering discipline with a minor in materials science and engineering.

### Materials Science and Engineering Concentration

The B.S. in engineering science with a concentration in materials science and engineering requires satisfaction of the curriculum requirements of engineering science. The student must take 27 hours of materials science and engineering program electives that include MSE 1500 and MSE 2500 with the additional materials science related courses selected to provide a meaningful sequence that must be planned in advance and approved by the faculty adviser.

## Materials Science and Engineering Minor

The minor in materials science and engineering is designated to provide the student with an understanding of engineering materials. The goal is to complement and add to the student's major in one of the other engineering disciplines for an interdisciplinary approach to problem solving. The minor program in materials science and engineering requires 16 hours of program courses, of which 7 hours are devoted to MSE 1500/1500L and MSE 2500. No more than 10 hours below the 2500 level may be applied to the minor.

### Program Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

MSE 1500, 1500L	Materials Science I and Laboratory
MSE 2500	Materials Science II

The remaining 9 hours can be chosen from the following list of courses.

MSE 3851	Undergraduate Research
MSE 3889-3890	Special Topics
BME 2100	Introductory Biomechanics
BME 2200	Biomedical Materials: Structure, Property, and Applications
BME 4200	Principles and Applications BioMicroElectroMechanical Systems (BioMEMS)
BME 4500	Nanobiotechnology
CHBE 4840	Applications of Metal and Metal Oxide Nanostructures
CHBE 4850	Semiconductor Materials Processing
CHBE 4860	Molecular Aspects of Chemical Engineering
CHBE 4870	Polymer Science and Engineering
CHBE 4880	Corrosion Science and Engineering
CE 2205	Mechanics of Materials
CE 3205	Structural Design
CE 4200	Advanced Structural Steel Design
CE 4210	Advanced Reinforced Concrete Design
CE 4211	Mechanics of Composite Materials
EECE 4283	Principles and Models of Semiconductor Devices
EECE 4284	Integrated Circuit Technology and Fabrication
ME 3202	Machine Analysis and Design
ME 4251	Modern Manufacturing Processes
ME 4275	Introduction to Finite Element Analysis
CHEM 3010	Inorganic Chemistry
CHEM 3300	Physical Chemistry: Quantum Mechanics, Spectroscopy, and Kinetics
CHEM 3630	Macromolecular Chemistry: Polymers, Dendrimers, and Surface Modification
PHYS 2250W	Introduction to Quantum Physics and Applications I
PHYS 2290	Electricity, Magnetism, and Electrodynamics
PHYS 3640	Physics of Condensed Matter

Course descriptions begin on page 337.

## Mechanical Engineering

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THE vitality of our nation depends upon innovation in the design of new machines, devices to satisfy society's needs, engines to produce power efficiently, equipment to condition the environment of our buildings, and the systems to use and control these engineered products. Mechanical engineers are involved in solving problems by originating design concepts, developing products and processes of manufacture, and designing hardware and the systems needed to satisfy society's demands. Mechanical engineers work in virtually all industries.

The study of mechanical engineering requires a basic understanding of mathematics, chemistry, physics, and the engineering sciences. Mechanical engineering education emphasizes solid mechanics; dynamics of machines; aerodynamics; propulsion devices; material behavior; power producing and environmental conditioning processes; control of dynamics of machines; energy conversion; and the synthesis, development, evaluation, and optimization of designs of devices and systems.

*Degree Programs.* The Department of Mechanical Engineering offers the B.E., M.Eng., M.S., and Ph.D. in mechanical engineering.

The curriculum in mechanical engineering leading to a bachelor of engineering provides a broad-based engineering education with opportunities for the student to elect courses in areas of study related to any industry and, with careful planning of the elective courses, to achieve some specialization. The mechanical engineering program prepares an individual to become a practicing engineer who can participate fully in the engineering activities of design, building, operation, production, maintenance, safety, marketing, sales, research, and administration.

*Undergraduate Honors Program.* See the Special Programs chapter for general requirements of the professional Honors Program in mechanical engineering. Honors candidates choose their technical elective courses with the advice and consent of an honors adviser. Each candidate is expected to take ME 3860 and at least 6 hours of graduate courses numbered 5000 or higher, including one course numbered 8000 or higher.

A formal written honors thesis on the candidate's research must be approved by the honors adviser and the department chair. Honors candidates shall meet all Engineering School requirements in the nontechnical areas. The diploma designation is Honors in Mechanical Engineering.

*Facilities.* Undergraduate instructional laboratories are equipped for studies in heat and power, refrigeration and air-conditioning, fluid flow, heat transfer, design, controls, robotics, instrumentation, and biomechanics. Specialized facilities for robotic surgery, rehabilitation robotics, energy storage, medical microfluidics, thermal transport, combustion characterization, and photonics are used for both faculty-led research and instruction. The department also maintains various maker spaces including machine shops and design studios for fabrication of experimental equipment and for instruction.

### Curriculum Requirements

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The B.E. in mechanical engineering requires a minimum of 126 hours, distributed as follows:

1. Mathematics (17 hours). Required courses: MATH 1300, 1301, 2300, 2420. Required elective: one from courses numbered 2410 and above, except 3000.
2. Basic Science (16 hours). Required courses: CHEM 1601/1601L, MSE 1500/1500L (or CHEM 1602/1602L), PHYS 1601/1601L, 1602/1602L.
3. Engineering Science (25 hours). Required courses: ES 1401, 1402, 1403; CE 2200, 2205; CS 1101 or CS 1103; EECE 2112; ME 2190, 2220, 3224; MSE 2205.
4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.

5. Open electives (6 hours).
6. ME core (26 hours). ME 2160, 2171, 3202, 3204, 3234, 3248, 4213, 4950, 4951, and 4959
7. Technical electives (9 hours). To be selected from the following approved courses. Courses selected from the College of Arts and Science must be designated a Mathematics and Natural Sciences (MNS) course in the AXLE curriculum.
  - a) Engineering courses except ENGM 2440, 3350, 4800, ES 2700, 2900, and CS 1151
  - b) Mathematics courses numbered 2420 or higher except MATH 3000
  - c) Chemistry courses numbered 2000 or higher
  - d) Physics courses numbered 2000 or higher
  - e) Astronomy courses
  - f) Biological Science courses
  - g) Earth and Environmental Science courses
  - h) Neuroscience courses

At least 3 hours must be numbered 2000 or above.

8. Professional (ME) depth (a minimum of 9 hours). Each student must choose at least 9 hours of ME elective courses.

No one-credit-hour ME course except 3841 can be used as a mechanical engineering elective. A maximum of three one-credit-hour ME courses may be used as technical electives. Additional ME one-credit-hour courses can be open electives. At least one "W"-designated course in the English language must be included on a graded basis.

Undergraduates in mechanical engineering may apply the pass/fail option only to non-departmental courses taken as open electives, technical electives, or part of the liberal arts core, subject to the school requirements for pass/fail.

### Specimen Curriculum for Mechanical Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
<b>ME 2160</b>	Introduction to Mechanical Engineering Design	3	–
<b>MATH 2300</b>	Multivariable Calculus	3	–
<b>MATH 2420</b>	Methods of Ordinary Differential Equations	–	3
<b>PHYS 1602</b>	General Physics II	3	–
<b>PHYS 1602L</b>	General Physics Laboratory II	1	–
<b>CE 2200</b>	Statics	3	–
<b>ME 2171</b>	Instrumentation Laboratory	–	2
<b>ME 2190</b>	Dynamics	–	3
<b>ME 2220</b>	Thermodynamics	–	3
<b>EECE 2112</b>	Circuits I	–	3
	Liberal Arts Core	3	3
		16	17



		Semester hours	
JUNIOR YEAR		FALL	SPRING
<b>ME 3202</b>	Machine Analysis and Design	3	–
<b>ME 3204</b>	Mechatronics	–	3
<b>ME 3224</b>	Fluid Mechanics	3	–
<b>ME 3234</b>	System Dynamics	4	–
<b>ME 3248</b>	Heat Transfer	–	3
<b>CE 2205</b>	Mechanics of Materials	3	–
<b>MSE 2205</b>	Strength and Structure of Engineering Materials	1	–
	Mechanical Engineering Elective	–	3
	Open Elective	–	3
	Liberal Arts Core	3	–
	Mathematics Elective	–	3
		<hr/>	<hr/>
		17	15
SENIOR YEAR			
<b>ME 4213</b>	Energetics Laboratory	2	–
<b>ME 4950</b>	Design Synthesis	2	–
<b>ME 4951</b>	Engineering Design Projects	–	3
<b>ME 4959</b>	Senior Engineering Design Seminar	1	–
	Mechanical Engineering Elective	3	3
	Liberal Arts Core	3	3
	Technical Elective	6	3
	Open Elective	–	3
		<hr/>	<hr/>
		17	15

Course descriptions begin on page 338.

# Nanoscience and Nanotechnology

DIRECTORS Paul E. Laibinis, Sandra J. Rosenthal

## Affiliated Faculty

PROFESSORS David E. Cliffler (Chemistry), Peter T. Cummings (Chemical and Biomolecular Engineering), Philippe M. Fauchet (Electrical Engineering), Daniel M. Fleetwood (Electrical Engineering), Kenneth F. Galloway (Electrical Engineering), Todd D. Giorgio (Biomedical Engineering), Scott A. Guelcher (Chemical and Biomolecular Engineering), Richard F. Haglund, Jr. (Physics), Timothy P. Hanusa (Chemistry), Frederick R. Haselton (Biomedical Engineering), G. Kane Jennings (Chemical and Biomolecular Engineering), Weng P. Kang (Electrical Engineering), Paul E. Laibinis (Chemical and Biomolecular Engineering), Deyu Li (Mechanical Engineering), Charles M. Lukehart (Chemistry), Clare M. McCabe (Chemical and Biomolecular Engineering), Sokrates T. Pantelides (Physics), Peter N. Pintauro (Chemical and Biomolecular Engineering), Sandra J. Rosenthal (Chemistry), Ronald D. Schrimpf (Electrical Engineering), Norman H. Tolk (Physics), Sharon M. Weiss (Electrical Engineering), John P. Wikswo, Jr. (Physics), David W. Wright (Chemistry)

ASSOCIATE PROFESSORS Kirill Bolotin (Physics), Craig L. Duvall (Biomedical Engineering), Eva M. Harth (Chemistry), Bridget R. Rogers (Chemical and Biomolecular Engineering), Florence Sanchez (Civil Engineering), Kalman Varga (Physics), Greg Walker (Mechanical Engineering), James E. Wittig (Materials Science and Engineering), Yaqiong Xu (Physics)

ASSISTANT PROFESSORS Rizia Bardhan (Chemical and Biomolecular Engineering), Leon Bellan (Mechanical Engineering), Janet E. MacDonald (Chemistry), Cary L. Pint (Mechanical Engineering), Jason G. Valentine (Mechanical Engineering), John T. Wilson (Chemical and Biomolecular Engineering)

RESEARCH ASSOCIATE PROFESSOR Anthony B. Hmelo (Physics)

RESEARCH ASSISTANT PROFESSORS Bo Choi (Electrical Engineering), Dmitry Koktysh (Chemistry), James R. McBride (Chemistry)

FACULTY in the School of Engineering and the College of Arts and Science offer an interdisciplinary minor in nanoscience and nanotechnology. The minor is administered by the School of Engineering.

Nanoscience and nanotechnology are based on the ability to synthesize, organize, characterize, and manipulate matter systematically at dimensions of ~1 to 100 nm, creating uniquely functional materials that differ in properties from those prepared by traditional approaches. At these length scales, materials can take on new properties that can be exploited in a wide range of applications such as for solar energy conversion, ultra-sensitive sensing, and new types of vaccines. These activities require the integration of expertise from various areas of science and engineering, often relying on methods of synthesis, fabrication, and characterization that are beyond those encountered in an individual course of study.

Students who minor in nanoscience and nanotechnology learn the principles and methods used in this rapidly growing field. Its core originates in the physical sciences by providing key approaches for describing the behavior of matter on the nanoscale. Synthetic approaches are used to manipulate matter systematically, for creating uniquely functional nanomaterials that can be inorganic, organic, biological, or a hybrid of these. With a third component of characterization, a process for designing systems to have particular properties as a result of their composition and nanoscale arrangement emerges. Students are introduced to these areas through foundational and elective courses for the minor that

are specified below, the latter of which can be selected to fulfill the degree requirements for their major.

The minor in nanoscience and nanotechnology is supported by the Vanderbilt Institute of Nanoscale Science and Engineering (VINSE) that brings together faculty from the College of Arts and Science, the School of Engineering, and the Medical Center. A specialized laboratory facility maintained by VINSE provides students in the minor with capstone experiences that allow them to prepare and characterize a variety of nanostructured systems using in-house state-of-the-art instrumentation. This hands-on laboratory component enhances the attractiveness of students to both employers and graduate schools.

## Nanoscience and Nanotechnology Minor

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The minor in nanoscience and nanotechnology requires a total of 15 credit hours, distributed as follows.

1. CHEM 2610 or CHBE 4840 (3 hours)
2. Nanoscience and Nanotechnology 3000. (3 hours)
3. PHYS 2660. (3 hours)
4. Elective courses. 6 hours selected from the following list of approved subjects.

BME 4200	Principles and Applications of BioMicro ElectroMechanical Systems (BioMEMS)
BME 4500	Nanobiotechnology
CHBE 4830	Molecular Simulation
CHBE 4840	Applications of Metal and Metal Oxide Nanostructures
CHBE 4850	Semiconductor Materials Processing
CHBE 4860	Molecular Aspects of Chemical Engineering
CHBE 4870	Polymer Science and Engineering
CHBE 4880	Corrosion Science and Engineering
CHEM 2610	Introduction to Nanochemistry
CHEM 3300	Physical Chemistry: Quantum Mechanics, Spectroscopy, and Kinetics
CHEM 3630	Macromolecular Chemistry: Polymers, Dendrimers, and Surface Modification
CHEM 5610	Chemistry of Inorganic Materials
EECE 4283	Principles and Models of Semiconductor Devices
EECE 4284	Integrated Circuit Technology and Fabrication
EECE 4288	Optoelectronics
EECE 4385	VLSI Design
EECE 6306	Solid-State Effects and Devices
IMS 5320	Nanoscale Science and Engineering
ME 8320	Statistical Thermodynamics
ME 8323	Introduction to Micro/Nanoelectromechanical Systems
ME 8365	Micro/Nanoscale Energy Transport
MSE 6310	Atomic Arrangements in Solids
PHYS 2250	Introduction to Quantum Dynamics and Applications I
PHYS 3640	Physics of Condensed Matter

Courses taken to satisfy relevant degree requirements for majors in the College of Arts and Science and the School of Engineering may also be counted toward fulfilling the minor.

# Scientific Computing

DIRECTORS Robert E. Bodenheimer, Thomas J. Palmeri, David A. Weintraub

## Affiliated Faculty

PROFESSORS Ralf Bennartz (Earth and Environmental Sciences), Gautam Biswas (Electrical Engineering and Computer Science), Mario Crucini (Economics), Peter T. Cummings (Chemical and Biomolecular Engineering), Mark N. Ellingham (Mathematics), David Furbish (Earth and Environmental Sciences), Guilherme Gualda (Earth and Environmental Sciences), Gordon D. Logan (Psychology), Terry P. Lybrand (Chemistry and Pharmacology), Charles F. Maguire (Physics), Clare M. McCabe (Chemical and Biomolecular Engineering), Jens Meiler (Chemistry), Michael I. Miga (Biomedical Engineering), Mark Neamtu (Mathematics), Thomas J. Palmeri (Psychology and Neuroscience), Antonis Rokas (Biological Sciences), Jeffrey D. Schall (Psychology and Neuroscience), Larry Schumaker (Mathematics), Paul Sheldon (Physics), David A. Weintraub (Astronomy), Robert Weller (Electrical Engineering)

ASSOCIATE PROFESSORS Andreas A. Berlind (Astronomy), Robert E. Bodenheimer (Computer Science), Kelly Holley-Bockelmann (Astronomy), Shane Hutson (Physics), Bennett Landman (Electrical Engineering), Haoxiang Luo (Mechanical Engineering), Kalman Varga (Physics), Greg Walker (Mechanical Engineering), Steve Wernke (Anthropology)

ASSOCIATE PROFESSOR OF THE PRACTICE Gerald H. Roth (Computer Science)

ASSISTANT PROFESSORS Tony Capra (Biological Sciences and Biomedical Informatics), William Holmes (Physics and Astronomy), Carlos Lopez (Cancer Biology), Sean Polyn (Psychology and Neuroscience), Jennifer Trueblood (Psychology)

ADJUNCT ASSISTANT PROFESSORS William R. French (Chemical and Biomolecular Engineering), Davide Vanzo (Chemistry)

FACULTY in the School of Engineering and the College of Arts and Science offer an interdisciplinary minor in scientific computing to help natural and social scientists and engineers acquire the ever-increasing computational skills that such careers demand. The minor is administered by the School of Engineering. Students who complete this minor will have a toolkit that includes programming skills useful for simulating physical, biological, and social dynamics, as well as an understanding of how to take advantage of modern software tools to extract meaningful information from small and large datasets.

Computation is now an integral part of modern science and engineering. In science, computer simulation allows the study of natural phenomena impossible or intractable through experimental means. In engineering, computer simulation allows the analysis and synthesis of systems too expensive, dangerous, or complex to model and build directly. Astronomers studying the formation of massive black holes, neuroscientists studying neural networks for human memory, mechanical engineers studying the designs of turbines and compressors, and electrical engineers studying the reliability of electronics aboard spacecraft are united both in the computational challenges they face and the tools and techniques they use to solve these challenges.

Students in the program in scientific computing are taught techniques for understanding such complex physical, biological, and also social systems. Students are introduced to computational methods for simulating and analyzing models of complex systems, to scientific visualization and data mining techniques needed to detect structure in massively large multidimensional data sets, to high performance computing techniques for simulating models on computing clusters with

hundreds or thousands of parallel, independent processors and for analyzing terabytes or more of data that may be distributed across a massive cloud or grid storage environment.

Scientific computing at Vanderbilt is supported by faculty and includes students from a wide range of scientific and engineering disciplines. While the content domain varies, these disciplines often require similar computational approaches, high-performance computing resources, and skills to simulate interactions, model real-life systems, and test competing hypotheses. Scientific computing embodies the computational tools and techniques for solving many of the grand challenges facing science and engineering today.

The minor in scientific computing prepares students for advanced coursework that combines computational approaches with a substantive area of science or engineering. It prepares students for directed or independent study with a faculty member on a research project. It prepares students for advanced study in graduate school. It provides skills that will be attractive to many employers after graduation.

The minor in scientific computing is distinct from the minor in computer science. Scientific computing uses computation as a tool to solve scientific and engineering problems in research and application. It is more focused on simulation, numerical techniques, high performance computing, and higher-level methods than the minor in computer science, which is focused on the algorithms, systems, and technologies that enable such methods to be developed and employed.

## Scientific Computing Minor

**NOTE:** New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

The minor in scientific computing requires 15 credit hours, distributed as follows:

1. CS 1101 or 1103. (3 hours)
2. CS 2204 (CS 2201 may be substituted for 2204 with the approval of a program director). (3 hours)
3. Scientific Computing 3250. (3 hours)
4. 6 hours of electives. Electives include courses in the Scientific Computing (SC) minor, courses approved for SC credit that are in another subject area, courses that meet the approval of a Director of the SC minor, and directed or independent study with a faculty member affiliated with the SC minor.

SC 3260	High Performance Computing
SC 3890	Special Topics in Scientific Computing. [1-3 each semester]
SC 3841	Directed Study in Scientific Computing
SC 3842	Directed Study in Scientific Computing
SC 3843	Directed Study in Scientific Computing
SC 3851	Independent Study in Scientific Computing
SC 3852	Independent Study in Scientific Computing
SC 3853	Independent Study in Scientific Computing

Approved elective courses by subject are listed below. These electives provide a detailed treatment of core scientific computing tools and techniques or combine scientific computing tools and techniques with a substantive area of science or engineering. Electives require a significant amount of course work that involves coding solutions to scientific or engineering problems as opposed to running programs someone else wrote, downloaded, or purchased.

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Anthropology 3261	Introduction to Geographic Information Systems and Remote Sensing
ASTR 3600	Stellar Astrophysics
ASTR 3700	Galactic Astrophysics
ASTR 3800	Structure Formation in the Universe
BSCI 3272	Genome Science
BME 4310	Modeling Living Systems for Therapeutic Bioengineering
CHBE 4830	Molecular Simulation
CHEM 5410	Molecular Modeling Methods
CHEM 5420	Computational Structure and Chemical Biology
CS 3274	Modeling and Simulation
EES 4760	Agent- and Individual-Based Computational Modeling
EECE 6258	Quantitative Medical Image Analysis
ECON 3050	Introduction to Econometrics
MATH 3620	Introduction to Numerical Mathematics
MATH 3630	Mathematical Modeling in Biology
MATH 3660	Mathematical Modeling in Economics
MATH 4600	Numerical Analysis
MATH 4620	Linear Optimization
MATH 4630	Nonlinear Optimization
MATH 9600	Computing with Splines
ME 4263	Computational Fluid Dynamics and Multiphysics Modeling
PHYS 2237	Computational Physics
PHYS 3207	Computational Thermodynamics and Statistical Physics
Psychology 8218	Computational Modeling
Psychology 8219	Scientific Computing for Psychological and Brain Sciences
Psychology 8503	Models of Human Memory

# Engineering Courses

## Biomedical Engineering

**BME 2100. Introductory Biomechanics.** [Formerly BME 101] Structure and mechanics of the musculoskeletal system and to the properties and strength of biological materials. Application of Newtonian mechanics, statics, and strength of materials to bone, muscle, tendon, other biological material, and medical devices. Credit offered for only one of BME 2100 or CE 2200. Prerequisite: PHYS 1601, MATH 1301, and CS 1103. FALL. [3]

**BME 2200. Biomedical Materials: Structure, Property, and Applications.** [Formerly BME 103] Structure-property relationships in both natural and synthetic, hard and soft materials. Bio-inspired materials design, the role of self-assembly in achieving highly ordered structures, material design and properties for emerging biomedical applications, factors influencing biocompatibility, performance of biomaterials in both soft and hard tissues, and biological response to implants. Prerequisite: CHEM 1602, BME 2100. SPRING. [3]

**BME 2201. Biomedical Engineering Ethics.** [Formerly BME 201] Ethical principles in the practice of biomedical engineering: responsibility in professional practice, health care, research and mentoring. Development of skills in perceptiveness, discernment, competency and visualization of alternatives through case studies. Prerequisite: Junior or senior standing. FALL. [3] (Only available for open elective credit for biomedical engineering majors.) (Not currently offered)

**BME 2210. Biomaterial Manipulation.** [Formerly BME 203] Design and characterization of biomaterials. Assessment of tissue engineering scaffolds and nanoparticles. Manipulation of cell growth and expression. Application of mechanics and materials principles to medical and consumer products. Laboratory exercises in tissue culture, microscopy, mechanical testing, biochemical assays, and computer modeling. Prerequisite: BME 2100, BSCI 1510/1510L. Corequisite: BME 2200. SPRING. [3]

**BME 3000. Physiological Transport Phenomena.** [Formerly BME 210] An introduction to the mechanics of fluids, heat transfer, and mass transfer in living systems. Basic theories of transport phenomena are presented and applied to mammalian and cellular physiology as well as to the design of medical devices. Prerequisite: BME 2100, 2200 or equivalent, MATH 2400 or 2420. [3]

**BME 3100. Systems Physiology.** [Formerly BME 251] An introduction to quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (nervous, musculoskeletal, cardiovascular, gastrointestinal). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. Prerequisite: CS 1103. Corequisite: BSCI 1510. FALL. [3]

**BME 3101. Systems Physiology.** [Formerly BME 252] An introduction to quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (blood, immune, endocrine, respiratory, renal, reproductive). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. Prerequisite: CS 1103. Corequisite: BSCI 1510. SPRING. [3]

**BME 3110. Neuromuscular Mechanics and Physiology.** [Formerly BME 253] Quantitative characterization of the physiological and mechanical properties of the neuromuscular system. Quantitative models of system components. Applications to fatigue, aging and development, injury and repair, and congenital and acquired diseases. Prerequisite: BME 2100, BME 3100. SPRING. [3]

**BME 3200. Analysis of Biomedical Data.** [Formerly BME 260] Application of modern computing methods to the statistical analysis of biomedical data. Sampling, estimation, analysis of variance, and the principles of experimental design and clinical trials are emphasized. Prerequisite: MATH 2300. SPRING. [3]

**BME 3300. Biomedical Instrumentation.** [Formerly BME 271] Introduces methods used to determine physiological functions and variables from the point of view of optimization in the time and frequency domain and the relation to physiological variability. Laboratory exercises stress instrumentation usage and data analysis. Three lectures and one laboratory. Prerequisite: EECE 2213 and 2213L. FALL, SPRING. [4]

**BME 3600. Signal Measurement and Analysis.** [Formerly BME 263] Discrete time analysis of signals with deterministic and random properties and the effect of linear systems on these properties. Brief review of relevant topics in probability and statistics and introduction to random processes. Discrete Fourier transforms, harmonic and correlation analysis, and signal modeling. Implementation of these techniques on a computer is required. Corequisite: BME 3200 or MATH 2810. SPRING. [3]

**BME 3830. Biomedical Engineering Service Learning and Leadership.** [Formerly BME 249] Identification of local and global human needs, methods of need quantification, implementation of engineering solutions, sustainability, preparation of grant proposals, leadership principles. Independent service project required. Prerequisite: Junior standing. FALL [3]

**BME 3860. Undergraduate Research.** [Formerly BME 240A] Independent research, either experimental or theoretical in nature or a combination of both, under the supervision of a biomedical engineering faculty member or another faculty member approved by the course director. Prerequisite: Consent of course director. [1-3 each semester; maximum of 6 hours total for all semesters of BME 3860 and 3861.]

**BME 3861. Undergraduate Research.** [Formerly BME 240B] A continuation of the research in 3860 or research in a different area of biomedical engineering. Prerequisite: Consent of course director. [1-3 each semester; maximum of 6 hours total for all semesters of BME 3860 and 3861.]

**BME 3890. Special Topics.** [Formerly BME 290A] Different topics taught. [3] (Offered periodically)

**BME 3891. Special Topics.** [Formerly BME 290B] Different topics taught. [3] (Offered periodically)

**BME 3892. Special Topics.** [Formerly BME290C] Different topics taught. [3] (Offered periodically)

**BME 3893. Special Topics.** [Formerly BME 290D] Different topics taught. [3] (Offered periodically)

**BME 4000. Bioelectricity.** [Formerly BME 256] Cellular basis of the electrical activity of nerve and muscle cells; action potential propagation; voltage- and ligand-gated ion channels; space, voltage, and patch clamp; and electrical, optical, and magnetic measurements of bioelectric activity in cells, isolated tissues, intact animals, and humans. Prerequisite: MATH 2400 or 2420, BSCI 1510. FALL. [3]

**BME 4100. Lasers in Surgery and Medicine.** [Formerly BME 285] Fundamentals of lasers, light-tissue interaction, problem-based design of optical instrumentation. Applications in laser surgery, disease detection, and surgical guidance. Includes hands-on experiences. Prerequisite: PHYS 1602. FALL. [3]

**BME 4100L. Biomedical Optics Laboratory.** [Formerly BME 285L] Practical experience in basics of operating lasers, using optics, fiber optics and interferometry. Computer-aided design of optical systems and computer simulations of light tissue interaction. Application of optical concepts to biomedical problems. Prerequisite: Senior standing. Corequisite: BME 4100. FALL. [1]

**BME 4200. Principles and Applications of BioMicroElectroMechanical Systems (BioMEMS).** [Formerly BME 274] The principles, design, fabrication and application of micro- and nano-devices to instrument and control biological molecules, living cells, and small organisms, with

a strong emphasis on development of microfabricated systems and micro- and nano-biosensors. Students will lead discussions from the research literature. Graduate students will prepare a research proposal or fabricate a functioning BioMEMS device. FALL. [3]

**BME 4200L. BioMicroElectroMechanical Systems Laboratory.** [Formerly BME 274L] Design, fabrication, and testing of BioMEMS devices for applications in the life sciences. Practical experience in photolithography, replica molding to fabricate microfluidic devices, and multilayer devices to assemble microfluidic devices with active valves. Corequisite: BME 4200. FALL. [1]

**BME 4300. Therapeutic Bioengineering.** [Formerly BME 275] Explores the engineering aspects of treating disease or disorders. Surgical mechanics, diffusion therapies including chemical and energy diffusion, image-guided therapies, and the role of discovery and design in the development of medical treatments. Prerequisite: EECE 2213, BME 3000. Corequisite: BME 2100, BME 3300. SPRING. [3]

**BME 4310. Modeling Living Systems for Therapeutic Bioengineering.** [Formerly BME 279] Introduction to computer modeling and simulation in therapeutic bioengineering processes. Building computer models and using modern modeling software tools. Introduction to numerical techniques to solve differential equations and origin of mathematical models for biotransport, biomechanics, tumor/virus growth dynamics, and model-based medical imaging techniques. Prerequisite: MATH 2400 or MATH 2420, CS 1103 or equivalent, BME 2100 or equivalent mechanics course. SPRING. [3]

**BME 4400. Foundations of Medical Imaging.** [Formerly BME 258] Physics and engineering of image formation by different modalities used for medical applications. Concepts common to different imaging modalities and limits of physical phenomena. Mathematical concepts of image formation and analysis; techniques for recording images using ionizing radiation (including CT), ultrasound, magnetic resonance, and nuclear (including SPECT and PET). Methods of evaluating image quality. Prerequisite: PHYS 1602, 1602L, MATH 2400. Credit offered for only one of BME 4400 and PHYS 2805. SPRING. [3]

**BME 4410. Biological Basis of Imaging.** [Formerly BME 276] Physical and chemical relationships between biological characteristics of tissue and image contrast in major medical imaging modalities. Imaging modalities include x-ray, MRI, PET, and ultrasound. Applications include neurological disorders, neurological function, cardiac function and disease, cancer, and musculoskeletal physiology. Prerequisite: BME 4400 or equivalent. SPRING. [3].

**BME 4420. Quantitative and Functional Imaging.** [Formerly BME 277] Introduction to quantitative analysis of non-invasive imaging techniques to assess the structure and function of tissues in the body. Applications of computed tomography, positron emission tomography, ultrasound, and magnetic resonance imaging to tissue characterization. Measurement of lesion volume, cardiac output, organ perfusion, brain function, and receptor density. Prerequisite: BME 4400 and CS 1103 or equivalent. FALL. [3]

**BME 4500. Nanobiotechnology.** [Formerly BME 281] Synthesis and characterization of nanostructured materials for use in living systems. Clinical applications of nanoscale biosensors. Methods for single molecule detection in biological specimens. Quantitative structure/function assessment of nanostructures in living systems. Prerequisite: BSCI 1510; BME 3000 or CHBE 3300 or ME 3224. SPRING. [3]

**BME 4500L. Nanobiotechnology Laboratory.** [Formerly BME 281L] Laboratory experiments in the characterization of nanomaterial interactions with living systems. Biological surface functionalization of inorganic nanoparticles. Measurement of cultured mammalian cell response to nanostructures. Quantitative structure/function assessment of nanostructures in living systems. Corequisite: BME 4500. SPRING. [1]

**BME 4600. Introduction to Tissue Engineering.** [Formerly BME 280] Basic principles, methods, and current topics in tissue engineering. Integration of biology, materials science, and biomechanics in the design and fabrication of engineered tissues. Biomaterials for scaffolding, stem cell applications, bioreactor design, and practical methods

for testing. Case studies and guest lectures from experts in the field. Prerequisite: BSCI 1510; CHEM 1602 or equivalent. FALL. [3]

**BME 4900W. Biomedical Engineering Laboratory.** [Formerly BME 255W] Laboratory experiments in biomechanics, thermodynamics, biological transport, signal analysis, biological control, and biological imaging. Emphasis is on current methods, instrumentation, and equipment used in biomedical engineering; on oral presentation of results; and on the writing of comprehensive reports. One lecture and one three-hour laboratory per week. Prerequisite: BME 3100. Corequisite: BME 3000. [3]

**BME 4950. Design of Biomedical Engineering Devices and Systems I.** [Formerly BME 272] Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. Corequisite: BME 3300. Prerequisite: BME 3100. [2]

**BME 4951. Design of Biomedical Engineering Devices and Systems II.** [Formerly BME 273] Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. Prerequisite: BME 4950. [3]

**BME 4959. Senior Engineering Design Seminar.** [Formerly BME 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Required, to be taken in conjunction with BME 4950. FALL. [1]

**BME 5100. Lasers in Surgery and Medicine.** (Also listed as BME 4100) Fundamentals of lasers, light-tissue interaction, problem-based design of optical instrumentation. Applications in laser surgery, disease detection, and surgical guidance. Includes hands-on experiences. No credit for students who have earned credit for 4100. FALL. [3]

**BME 5110. Neuromuscular Mechanics and Physiology.** (Also listed as BME 3110) Quantitative characterization of the physiological and mechanical properties of the neuromuscular system. Quantitative models of system components. Applications to fatigue, aging and development, injury and repair, and congenital and acquired diseases. No credit for students who have earned credit for 3110. SPRING. [3]

**BME 5130. Systems Physiology.** (Also listed as BME 3100) An introduction to quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (nervous, musculoskeletal, cardiovascular, gastrointestinal). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. No credit for students who have earned credit for 3100. FALL. [3]

**BME 5131. Systems Physiology.** (Also listed as BME 3101) An introduction to quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (blood, immune, endocrine, respiratory, renal, reproductive). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. No credit for students who have earned credit for 3101. SPRING. [3]

**BME 5200. Principles and Applications of BioMicroElectroMechanical Systems (BioMEMS).** (Also listed as BME 4200) The principles, design, fabrication and application of micro- and nano-devices to instrument and control biological molecules, living cells, and small organisms, with a strong emphasis on development of microfabricated systems and micro- and nano-biosensors. Students will lead discussions from the research literature. Graduate students will prepare a research proposal or fabricate a functioning BioMEMS device. No credit for students who have earned credit for 4200. FALL. [3]

**BME 5210. Biomaterial Manipulation.** (Also listed as BME 2210) Design and characterization of biomaterials. Assessment of tissue engineering scaffolds and nanoparticles. Manipulation of cell growth and expression. Application of mechanics and materials principles to medical and consumer products. Laboratory exercises in tissue culture, microscopy, mechanical testing, biochemical assays, and computer modeling. No credit for students who have earned credit for 3210. Corequisite: BME 2200. SPRING. [3]

**BME 5300. Biomedical Instrumentation.** (Also listed as BME 3300) Introduces methods used to determine physiological functions and variables from the point of view of optimization in the time and frequency domain and the relation to physiological variability. Laboratory exercises stress instrumentation usage and data analysis. Three lectures and one laboratory. No credit for students who have earned credit for 3300. FALL, SPRING. [4]

**BME 5301. Therapeutic Bioengineering.** (Also listed as BME 4300) Explores the engineering aspects of treating disease or disorders. Surgical mechanics, diffusion therapies including chemical and energy diffusion, image-guided therapies, and the role of discovery and design in the development of medical treatments. No credit for students who have earned credit for 4300. SPRING. [3]

**BME 5400. Foundations of Medical Imaging.** (Also listed as BME 4400) Physics and engineering of image formation by different modalities used for medical applications. Concepts common to different imaging modalities and limits of physical phenomena. Mathematical concepts of image formation and analysis; techniques for recording images using ionizing radiation (including CT), ultrasound, magnetic resonance, and nuclear (including SPECT and PET). Methods of evaluating image quality. No credit for students who have earned credit for 4400. SPRING. [3]

**BME 5410. Biological Basis of Imaging.** (Also listed as BME 4410) Physical and chemical relationships between biological characteristics of tissue and image contrast in major medical imaging modalities. Imaging modalities include x-ray, MRI, PET, and ultrasound. Applications include neurological disorders, neurological function, cardiac function and disease, cancer, and musculoskeletal physiology. No credit for students who have earned credit for 4410. SPRING. [3]

**BME 5500. Nanobiotechnology.** (Also listed as BME 4500) Synthesis and characterization of nanostructured materials for use in living systems. Clinical applications of nanoscale biosensors. Methods for single molecule detection in biological specimens. Quantitative structure/function assessment of nanostructures in living systems. No credit for students who have earned credit for 4500. SPRING. [3]

**BME 5600. Signal Measurement and Analysis.** (Also listed as BME 3600) Discrete time analysis of signals with deterministic and random properties and the effect of linear systems on these properties. Brief review of relevant topics in probability and statistics and introduction to random processes. Discrete Fourier transforms, harmonic and correlation analysis, and signal modeling. Implementation of these techniques on a computer is required. No credit for students who have earned credit for 3600. SPRING. [3]

**BME 5950. Design of Biomedical Engineering Devices and Systems I.** (Also listed as BME 4950) Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. Corequisite: BME 5300. No credit for students who have earned credit for 4950. [2]

**BME 5951. Design of Biomedical Engineering Devices and Systems II.** (Also listed as BME 4951) Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design

project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. No credit for students who have earned credit for 4951. [3]

**BME 6110. Research and Professional Development in Biomedical Engineering.** [Formerly BME 305] Database search strategies, interpreting engineering and scientific literature, communication skills, engineering design, proposal writing, preparation of engineering publications, technology transfer/intellectual property, engineering laboratory documentation, regulatory oversight, ethics, funding. SPRING. [3].

**BME 7110. Laser-Tissue Interaction and Therapeutic Use of Lasers.** [Formerly BME 320] Optical and thermal aspects and models of the interaction between laser/light and biological tissue as it is used for therapeutic applications in medicine and biology. Issues and objectives in therapeutic and surgical applications of lasers, overview of state-of-the-art topics and current research. FALL. [3]

**BME 7120. Optical Diagnosis: Principles and Applications.** [Formerly BME 321] Applications of light and tissue optical properties for the diagnosis of tissue pathology. Basic scientific and engineering principles for developing techniques and devices that use light to probe cells and tissues. Recent applications of different optical diagnostic techniques. SPRING. [3]

**BME 7310. Advanced Computational Modeling and Analysis in Biomedical Engineering.** [Formerly BME 329] Survey of current topics within biomedical modeling: biotransport, biomechanics, tumor and virus growth dynamics, model-based medical imaging techniques, etc. Mathematical development and analysis of biomedical simulations using advanced numerical techniques for the solution of ordinary and partial differential equations. Emphasis will be on graduate research related topics. SPRING. [3]

**BME 7410. Quantitative Methods in Biomedical Engineering.** [Formerly BME 300] Mathematics, quantitative analysis, and computational methods for biomedical engineering applications. Topics include applied probability and statistics, signal analysis and experiment design, linear systems, Fourier transforms, and numerical modeling and analysis. FALL. [3]

**BME 7413. Advanced Biomechanics.** [Formerly BME 313] Application of advanced concepts in statics, dynamics, continuum mechanics, and strength of materials to biological systems. Topics include measurement of mechanical properties of biological materials; rheological properties of blood; mechanics of cells, bone, skeletal muscle, and soft tissue; normal and abnormal dynamics of human movement; mechanics of articular joint movement; pulmonary mechanics; cardiac mechanics; arterial mechanics; mechanics of veins and collapsible vessels; and mechanics of flow in the microcirculation. Prerequisite: BME 2100, BME 3000 or equivalent. [3]

**BME 7419. Engineering Models of Cellular Phenomena.** [Formerly BME 319] Application of engineering methods to model and quantify aspects of cell physiology. Topics include receptor mediated cell processes, cell-cell signaling, cooperative barrier behavior, cell structural components, and cell motility. SPRING. [3] (Offered alternate years)

**BME 7420. Magnetic Resonance Imaging Methods.** [Formerly BME 378] MR techniques to image tissue for clinical evaluation and research. RF pulses, k-space trajectories, chemical shift, motion, flow, and relaxation. Derivation of signal equations for pulse sequence design and analysis. Course includes hands-on experimental studies. [3]

**BME 7425. Physical Measurements on Biological Systems.** [Formerly BME 325] A survey of the state-of-the-art in quantitative physical measurement techniques applied to cellular or molecular physiology. Topics include the basis for generation, measurement, and control of the transmembrane potential; electrochemical instrumentation; optical spectroscopy and imaging; x-ray diffraction for determination of macromolecular structure; magnetic resonance spectroscopy and imaging. Prerequisite: PHYS 2250. SPRING. [3]

**BME 7430. Cancer Imaging.** [Formerly BME 330] Applications of noninvasive, in vivo imaging (i.e., MRI, optical, CT, SPECT, PET, and ultrasound) to cancer biology. Emphasis on assessing the response

of tumors to treatment using emerging and quantitative imaging techniques. Prerequisite: BME 4400 or BME 302b/304b/304c or PHYS 2805. SPRING. (Offered alternate years) [3]

**BME 7440. Neuroimaging.** [Formerly BME 331] Applications of noninvasive imaging techniques including MRI, fMRI, optical, EEG, and PET to the study of neural systems. Emphasis on the human brain, with a focus on current scientific literature. Prerequisite: BME 4400 or BME 302b/304b/304c or PHYS 2805. FALL. (Offered alternate years) [3]

**BME 7450. Advanced Quantitative and Functional Imaging.** Analysis of non-invasive imaging techniques to assess the structure and function of tissues in the body. Applications of computed tomography, positron emission tomography, ultrasound, and magnetic resonance imaging to tissue characterization, including measurement of tissue volume, microstructure, organ perfusion, blood flow, brain function, and receptor density. Prerequisite: Working knowledge of MATLAB. FALL. [3]

**BME 7473. Design of Medical Products, Processes, and Services.** [Formerly BME 373] Medical design projects involving teams of graduate level engineering and management students. Projects are solicited from industry or universities and are undertaken from the initial phase of a design request to the end product, prototype, plan, or feasibility analysis. Prerequisite: BME 4950 or equivalent. SPRING. [3]

**BME 7500. Independent Study in Biomedical Engineering.** [Formerly BME 390] Study of advanced biomedical engineering topics not regularly offered in the curriculum. Consent of instructor is required. FALL, SPRING. [3]

**BME 7899. Master of Engineering Project.** [Formerly BME 389]

**BME 7999. Master's Thesis Research.** [Formerly BME 369]

**BME 8900. Special Topics.** [Formerly BME 395A] Different topics taught at graduate level. [1-3]

**BME 8901. Special Topics.** [Formerly BME 395B] Different topics taught at graduate level. [1-3]

**BME 8902. Special Topics.** [Formerly BME 395C] Different topics taught at graduate level. [1-3]

**BME 8903. Special Topics.** [Formerly BME 395D] Different topics taught at graduate level. [1-3]

**BME 8991. Biomedical Research Seminar.** [Formerly BME 391] [1]

**BME 8992. Biomedical Research Seminar.** [Formerly BME 392] [1]

**BME 8993. Biomedical Research Seminar.** [Formerly BME 393] [1]

**BME 8994. Biomedical Research Seminar.** [Formerly BME 394] [1]

**BME 8999. Non-Candidate Research.** [Formerly BME 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

**BME 9999. Ph.D. Dissertation Research.** [Formerly BME 399]

## Chemical and Biomolecular Engineering

**CHBE 2100. Chemical Process Principles.** [Formerly CHBE 161] A foundation for advanced work in chemical engineering. Process problems of a chemical and physico-chemical nature are considered. Emphasis is on stoichiometry, material balances, and energy balances required for design computation. FALL. [3]

**CHBE 2150. Molecular and Cell Biology for Engineers.** [Formerly CHBE 220] Basic molecular and cellular biology principles and concepts. Application of engineering principles to further the understanding of biological systems. Protein structure and function, transcription, translation, post-translational processing, cellular organization, molecular transport and trafficking, and cellular models. Credit given for only one of CHBE 2150 or BSCI 1510. Prerequisite: CHEM 1602. FALL. [3]

**CHBE 2200. Chemical Engineering Thermodynamics.** [Formerly CHBE 162] Application of the laws of thermodynamics to chemical

engineering systems. Entropy balances and analysis of thermodynamic cycles. Methods of estimating thermodynamic properties of pure fluids and mixtures, including equations of state, to provide background for chemical process design and simulation. SPRING. [3]

**CHBE 2250. Modeling and Simulation in Chemical Engineering.** [Formerly CHBE 180] Development of chemical engineering process models and their numerical solutions. The models include solution of linear and non-linear equations, eigenvalue problems, differentiation, and integration, ordinary differential equations, linear and nonlinear regression. Chemical process simulation using commercial simulators is introduced. Prerequisite: CHBE 2100. Corequisite: MATH 2420, CS 1103. SPRING. [3]

**CHBE 3200. Phase Equilibria and Stage-Based Separations.** [Formerly CHBE 223] Thermodynamic principles and calculations of mixture phase equilibrium. Development of correlations to design chemical separation processes. Applications to separation processes involving gases, liquids, and solids such as distillation, adsorption, and extraction. Simulation of separation processes. Prerequisite: CHBE 2200, and either CHBE 2250 or BME 2100. FALL. [3]

**CHBE 3250. Chemical Reaction Engineering.** [Formerly CHBE 225] Thermodynamic basis of chemical equilibrium. Analysis of chemical kinetic data and application to the design of chemical reactors. Batch, semibatch, and flow reactors are considered in both steady-state and transient operation. Brief treatments of catalysis and physical and chemical adsorption. Prerequisite: CHEM 2211 or 2221; CHBE 3200. SPRING. [3]

**CHBE 3300. Fluid Mechanics and Heat Transfer.** [Formerly CHBE 230] Principles of momentum and energy transport and their application to the analysis and design of chemical and biological engineering systems. Corequisite: MATH 2420. FALL. [3]

**CHBE 3350. Mass Transfer and Rate-Based Separations.** [Formerly CHBE 231] Principles of mass transfer and their application to the analysis of chemical and biological engineering systems. Design of rate-based separation operations. Prerequisite: CHBE 3300. SPRING. [3]

**CHBE 3600. Chemical Process Control.** [Formerly CHBE 242] Design of control systems for chemical processes. Principles of process dynamics and control of single and multivariable systems. Frequency and stability analyses and their effect on controller design. Prerequisite: CHBE 3200 and MATH 2420. SPRING. [3]

**CHBE 3860. Chemical Engineering Projects.** [Formerly CHBE 246] Opportunities for individual students to do research or design work under guidance of a faculty member. Requires faculty sponsorship of the project. No more than 6 total hours of CHBE 3860 and 3861 may be applied toward degree requirements. [Variable credit: 1-3 each semester]

**CHBE 3861. Chemical Engineering Projects.** [Formerly CHBE 247] Opportunities for individual students to do research or design work under guidance of a faculty member. Requires faculty sponsorship of the project. No more than 6 total hours of CHBE 3860 and 3861 may be applied toward degree requirements. [Variable credit: 1-3 each semester]

**CHBE 3890. Special Topics.** [Formerly CHBE 290] Prerequisite: consent of instructor. [Variable credit: 1-3 each semester] (Offered on demand)

**CHBE 3900W. Chemical Engineering Laboratory I.** [Formerly CHBE 228W] Laboratory experiments in momentum, energy and mass transport, focusing on instrumentation and unit operations. Statistical treatment of data, error analysis, written reports, and oral presentations are emphasized. Two lecture hours and one 5-hour laboratory per week. Prerequisite: CHBE 3300. Corequisite: CHBE 3350. SPRING. [4]

**CHBE 4500. Bioprocess Engineering.** [Formerly CHBE 283] Application of cellular and molecular biology to process engineering to describe the manufacture of products derived from cell cultures. Design and scale-up of bioreactors and separation equipment. Metabolic and protein engineering utilizing genetically engineered organisms. Prerequisite: BSCI 1510 or CHBE 2150; CHBE 3250, CHBE 3300. FALL. [3]



**CHBE 4810. Metabolic Engineering.** [Formerly CHBE 282] Analysis and synthesis of metabolic networks using principles of thermodynamics, kinetics, and transport phenomena. Computational approaches for predicting metabolic phenotypes. Experimental techniques to measure and manipulate key metabolic variables including pathway fluxes, protein/gene expression, enzyme regulation, and intracellular metabolite concentrations. Prerequisite: BSCI 1510 or CHBE 2150; junior standing. SPRING. [3]

**CHBE 4820. Immunoengineering.** Approaches and technologies for manipulating and studying the immune system. Topics include fundamentals of immunology, immunology tools and methods, vaccines and immunotherapies, drug delivery principles, and materials engineering for immunomodulation. Prerequisite: CHBE 2150 or BSCI 1510. [3]

**CHBE 4830. Molecular Simulation.** [Formerly CHBE 285] Introduction to the modern tools of statistical mechanics, such as Monte Carlo and molecular dynamics simulation, and variations. Understanding the methods, capabilities, and limitations of molecular simulation and applications to simple and complex fluids relevant to the chemical and related processing industries. Prerequisite: CHBE 3200, CHEM 3300. [3]

**CHBE 4840. Applications of Metal and Metal Oxide Nanostructures.** An engineering and materials science perspective on the electronic, photonic, catalytic, and surface properties of nanoscale metals and metal oxides. Applications in sensing, energy conversion, and storage. FALL [3]

**CHBE 4850. Semiconductor Materials Processing.** [Formerly CHBE 284] Introduction to the materials processing unit operations of silicon device manufacturing. Topics include basic semiconductor physics and device theory, production of substrates, dopant diffusion, ion implantation, thermal oxidation and deposition processes, plasma deposition processes, photolithography, wet chemical and plasma etching, and analytical techniques. FALL. [3]

**CHBE 4860. Molecular Aspects of Chemical Engineering.** [Formerly CHBE 286] Integration of molecular chemistry, property-based thermodynamic descriptions, and a focus on intermolecular energetics for process analysis and product design. Case studies involve molecular, macromolecular, supramolecular, and biomolecular systems. Prerequisite: CHEM 2211 or 2221; CHBE 2200. [3]

**CHBE 4870. Polymer Science and Engineering.** [Formerly CHBE 287] Macromolecular systems with emphasis on the interrelationship of chemical, physical, and engineering properties. Further relation of these properties to synthesis. Physicochemical and biological applications. Prerequisite: CHBE 2200, a basic understanding of organic and physical chemistry. [3]

**CHBE 4880. Corrosion Science and Engineering.** [Formerly CHBE 288] Aqueous-phase metal and alloy corrosion phenomena. Fundamental chemistry and electrochemistry theories, as applied to corroding systems. Specific forms of corrosion including pitting, crevice corrosion, and galvanic corrosion. Methods for corrosion control based on electrochemical fundamentals. Prerequisite: CHBE 3300 or graduate standing. SPRING [3]

**CHBE 4899. Atmospheric Pollution.** [Formerly CHBE 280] Fundamentals of atmospheric pollution and control. The sources and nature of gaseous and particulate air pollutants, the relation of meteorological conditions to their dispersal, and their effects on health and materials are discussed along with administration, standards, and control of air pollution. Prerequisite: Junior standing. SPRING. [3]

**CHBE 4900W. Chemical Engineering Laboratory II.** [Formerly CHBE 229W] Laboratory experiments in unit operations covering reactions and separations. Interpretation of data for equipment and process design. Writing and oral presentations are emphasized. One 5-hour laboratory per week. Prerequisite: CHBE 3200, CHBE 3250, CHBE 3350, CHBE 3900W. FALL. [3]

**CHBE 4950W. Chemical Engineering Process and Product Design.** [Formerly CHBE 233W] A systematic approach to design and safety practices for chemical process operations. Process and product design, economic evaluation of alternatives, ethics, and a cost and

safety analysis of a typical chemical, biological, or petroleum process and products. Steady-state and dynamic process simulations required. Three lecture hours and one two-hour laboratory each week. Prerequisite: CHBE 3200, CHBE 3250, CHBE 3350. FALL. [4]

**CHBE 4951W. Chemical Engineering Design Projects.** [Formerly CHBE 234W] Team-based, semester-long design project. Evaluation through periodic oral and written presentations, a final written report, and a poster report. Prerequisite: CHBE 4950W. SPRING. [3]

**CHBE 4959. Senior Engineering Design Seminar.** [Formerly CHBE 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. FALL. [1]

**CHBE 5200. Phase Equilibria and Stage-Based Separations.** (Also listed as CHBE 3200) Thermodynamic principles and calculations of mixture phase equilibrium. Development of correlations to design chemical separation processes. Applications to separation processes involving gases, liquids, and solids such as distillation, adsorption, and extraction. Simulation of separation processes. No credit for students who have earned credit for 3200. FALL. [3]

**CHBE 5250. Chemical Reaction Engineering.** (Also listed as CHBE 3250) Thermodynamic basis of chemical equilibrium. Analysis of chemical kinetic data and application to the design of chemical reactors. Batch, semibatch, and flow reactors are considered in both steady-state and transient operation. Brief treatments of catalysis and physical and chemical adsorption. No credit for students who have earned credit for 3250. SPRING. [3]

**CHBE 5300. Fluid Mechanics and Heat Transfer.** (Also listed as CHBE 3300) Principles of momentum and energy transport and their application to the analysis and design of chemical and biological engineering systems. No credit for students who have earned credit for 3300. FALL. [3]

**CHBE 5350. Mass Transfer and Rate-Based Separations.** (Also listed as CHBE 3350) Principles of mass transfer and their application to the analysis of chemical and biological engineering systems. Design of rate-based separation operations. No credit for students who have earned credit for 3350. SPRING. [3]

**CHBE 5500. Bioprocess Engineering.** (Also listed as CHBE 4500) Application of cellular and molecular biology to process engineering to describe the manufacture of products derived from cell cultures. Design and scale-up of bioreactors and separation equipment. Metabolic and protein engineering utilizing genetically engineered organisms. No credit for students who have earned credit for 4500. FALL. [3]

**CHBE 5600. Chemical Process Control.** (Also listed as CHBE 3600) Design of control systems for chemical processes. Principles of process dynamics and control of single and multivariable systems. Frequency and stability analyses and their effect on controller design. No credit for students who have earned credit for 5600. SPRING. [3]

**CHBE 5810. Metabolic Engineering.** (Also listed as CHBE 4810) Analysis and synthesis of metabolic networks using principles of thermodynamics, kinetics, and transport phenomena. Computational approaches for predicting metabolic phenotypes. Experimental techniques to measure and manipulate key metabolic variables including pathway fluxes, protein/gene expression, enzyme regulation, and intracellular metabolite concentrations. No credit for students who have earned credit for 4810. SPRING. [3]

**CHBE 5820. Immunoengineering.** Approaches and technologies for manipulating and studying the immune system. Topics include fundamentals of immunology, immunology tools and methods, vaccines and immunotherapies, drug delivery principles, and materials engineering for immunomodulation. No credit for students who have earned credit for 4820. [3]

**CHBE 5830. Molecular Simulation.** (Also listed as CHBE 4830) Introduction to the modern tools of statistical mechanics, such as Monte

Carlo and molecular dynamics simulation, and variations. Understanding the methods, capabilities, and limitations of molecular simulation and applications to simple and complex fluids relevant to the chemical and related processing industries. No credit for students who have earned credit for 4830. [3]

**CHBE 5840. Applications of Metal and Metal Oxide Nanostructures.** (Also listed as CHBE 4840) An engineering and materials science perspective on the electronic, photonic, catalytic, and surface properties of nanoscale metals and metal oxides. Applications in sensing, energy conversion, and storage. No credit for students who have earned credit for 4840. FALL [3]

**CHBE 5850. Semiconductor Materials Processing.** (Also listed as CHBE 4850) Introduction to the materials processing unit operations of silicon device manufacturing. Topics include basic semiconductor physics and device theory, production of substrates, dopant diffusion, ion implantation, thermal oxidation and deposition processes, plasma deposition processes, photolithography, wet chemical and plasma etching, and analytical techniques. No credit for students who have earned credit for 4850. FALL. [3]

**CHBE 5860. Molecular Aspects of Chemical Engineering.** (Also listed as CHBE 4860) Integration of molecular chemistry, property-based thermodynamic descriptions, and a focus on intermolecular energetics for process analysis and product design. Case studies involve molecular, macromolecular, supramolecular, and biomolecular systems. No credit for students who have earned credit for 4860. [3]

**CHBE 5870. Polymer Science and Engineering.** (Also listed as CHBE 4870) Macromolecular systems with emphasis on the interrelationship of chemical, physical, and engineering properties. Further relation of these properties to synthesis. Physicochemical and biological applications. No credit for students who have earned credit for 4870. [3]

**CHBE 5880. Corrosion Science and Engineering.** (Also listed as CHBE 4880) Aqueous-phase metal and alloy corrosion phenomena. Fundamental chemical and electrochemistry theories, as applied to corroding systems. Specific forms of corrosion including pitting, crevice corrosion, and galvanic corrosion. Methods for corrosion control based on electrochemical fundamentals. No credit for students who have earned credit for 4880. SPRING [3]

**CHBE 5890. Special Topics.** (Also listed as CHBE 3890) No credit for students who have earned credit for 3890. [Variable credit: 1-2 each semester] (Offered on demand)

**CHBE 5899. Atmospheric Pollution.** (Also listed as CHBE 4899) Fundamentals of atmospheric pollution and control. The sources and nature of gaseous and particulate air pollutants, the relation of meteorological conditions to their dispersal, and their effects on health and materials are discussed along with administration, standards, and control of air pollution. No credit for students who have earned credit for CHBE 4899. SPRING. [3]

**CHBE 6100. Applied Mathematics in Chemical Engineering.** [Formerly CHBE 310] Chemical engineering applications of advanced mathematical methods. Analytical and numerical methods for ordinary and partial differential equations. Emphasis on recognizing the form of a mathematical model and possible solution methods. Applications in heat and mass transfer, chemical kinetics. FALL. [3]

**CHBE 6110. Advanced Chemical Engineering Thermodynamics.** [Formerly CHBE 311] Application of the thermodynamics method to chemical engineering problems. Development of the first, second, and third laws of thermodynamics; estimation and correlation of thermodynamic properties; chemical and phase equilibria; irreversible thermodynamics. FALL. [3]

**CHBE 6120. Applied Chemical Kinetics.** [Formerly CHBE 313] Experimental methods in kinetics. Kinetics of industrial reactions and reactor design. Absorption and catalytic systems are considered. FALL. [3]

**CHBE 6200. Transport Phenomena.** [Formerly CHBE 312] The theory of non-equilibrium processes. Development of the analogy between

momentum, energy, and mass transport with applications to common engineering problems. SPRING. [3]

**CHBE 6215. Systems Analysis for Process Design and Control.** [Formerly CHBE 315] The design and control of chemical process plants, including economic optimization under steady state and transient conditions. [3]

**CHBE 6220. Surfaces and Adsorption.** [Formerly CHBE 320] Surface energy, capillarity, contact angles and wetting, surface films, insoluble monolayers, solid surfaces, membranes, surface area determination, adsorption, adhesion, interface thermodynamics, friction and lubrication, interface in composites, relationships of surface to bulk properties of materials. FALL. [3]

**CHBE 6250. Professional Communication Skills for Engineers.** [Formerly CHBE 395] Introduction of graduate-level written and oral communication skills for engineers. Skills needed to produce peer-reviewed journal publications, research proposals, and research presentations are covered. SPRING. [1]

**CHBE 7899. Master of Engineering Project.** [Formerly CHBE 389]

**CHBE 7999. Master's Thesis Research.** [Formerly CHBE 369]

**CHBE 8900. Special Topics.** [Formerly CHBE 397] [Variable credit: 1-3 each semester]

**CHBE 8991. Seminar.** [Formerly CHBE 398] [0]

**CHBE 8999. Non-Candidate Research.** [Formerly CHBE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

**CHBE 9999. Ph.D. Dissertation Research.** [Formerly CHBE 399]

## Civil Engineering

**CE 2100. Civil and Environmental Engineering Information Systems I.** [Formerly CE 160] Part I of a two-semester sequence course providing an introduction to information technologies utilized by civil and environmental engineers. Computer graphics and engineering drawings in civil and environmental engineering. Plans reading in civil engineering project development. Software tools to facilitate communication of engineering concepts and models via modern computer technology. FALL. [2]

**CE 2101. Civil and Environmental Engineering Information Systems.** Information technologies used by civil and environmental engineers. Lab and project-oriented course focusing on developing skills in engineering drawings, computer graphics, plans reading, leveling, mapping, and GIS. Integration of CAD and surveying with team-based projects. FALL [3] (Not offered in 2016/17)

**CE 2105. Civil and Environmental Engineering Information Systems II.** [Formerly CE 161] Part II of a two-semester sequence providing an introduction to information technologies utilized by civil and environmental engineers. Project-oriented course focusing on developing skills in leveling, mapping, and GIS. Integration of CAD and surveying in hands-on, team-oriented projects addressing specific civil engineering information systems. Project work will include familiarization with, and use of, department information systems instrumentation. Computer applications. Prerequisite: CE 2100. SPRING. [2]

**CE 2120. Sustainable Design in Civil Engineering.** Concepts and methods of sustainability; resilience in civil engineering design. Best practices. Economic, social, and environmental analysis. Ratings, indices, and measurements. Local, regional, and federal policy. Challenges posed by climate change. Sustainability and resilience rating systems. Applications to development and design. FALL. [3] (Not offered in 2016/17)

**CE 2200. Statics.** [Formerly CE 180] Vector analysis of two- and three-dimensional equilibrium of particles, rigid bodies, trusses, frames, and machines. Introduction to internal forces, shear and moment diagrams, cables, centroids, moments of inertia, and friction. Credit offered for only one of CE 2200 or BME 2100. Corequisite: MATH 1301, PHYS 1601. FALL, SPRING, SUMMER [3]

**CE 2205. Mechanics of Materials.** [Formerly CE 182] Stress and strain; tension, compression, and shear; Hooke's law, Mohr's circle, combined stresses, strain-energy. Beams, columns, shafts, and continuous beams. Deflections, shear and moment diagrams. Prerequisite: CE 2200. FALL, SPRING, SUMMER. [3]

**CE 3100W. Civil and Environmental Engineering Laboratory.** [Formerly CE 205W] A team project-oriented course that integrates principles of engineering design, simulation, and experimentation as applied to civil engineering. Emphasis on experimental design, data analysis, and technical communication. Prerequisite: CE 2205. SPRING. [2]

**CE 3200. Structural Analysis.** [Formerly CE 232] Classification; nature of loads and their calculation; analysis of statically determinate and indeterminate beams, trusses, and frames using classical methods (integration, moment area, energy) and matrix methods; basics of non-linear behavior; introduction to structural analysis software. Prerequisite: CE 2205. FALL. [3]

**CE 3205. Structural Design.** [Formerly CE 235] Loads and their identification; issues of safety and uncertainties; steel and concrete behavior and design of components in compression, tension, bending, shear; application to simple structural systems; use of the AISC Steel Specifications; sustainability issues. Prerequisite: CE 3200. SPRING [3]

**CE 3250. Geotechnical Engineering.** [Formerly CE 240] Origin, formation, identification, and engineering properties of soils. Discussion on index properties, soil moisture, soil structure, compressibility, shear strength, stress analysis, Rankine and Coulomb earth pressure theories and bearing capacity. Laboratory experiences. Graduate credit for earth and environmental sciences majors. Prerequisite: CE 2205. FALL. [3]

**CE 3300. Risk, Reliability, and Resilience Engineering.** Fundamental concepts in probability and statistical inference. Counting methods, discrete and continuous random variables, and their associated distributions. Sampling distributions, point estimation, confidence intervals, and hypothesis testing. Applications of probability and statistics to risk, reliability, and resilience of engineering systems. Prerequisite: MATH 2300. SPRING. [3] (Not offered in 2016/17)

**CE 3501. Transportation Systems Engineering.** [Formerly CE 225 and CE 3601] Planning, design, and operations of transportation systems. Particular emphasis on the design process, traffic engineering, urban transportation planning, the analysis of current transportation issues, and the ethics of transportation safety. FALL. [3]

**CE 3600. Environmental Engineering.** [Formerly CE 226] Parameters affecting environmental quality, including air and water pollutants; treatment techniques to achieve drinking water quality or permit safe discharge to the environment. Sustainability. Contaminant transport and interactions of contaminants with the environment. Risk assessment and governmental regulations covering air, water, solid and hazardous wastes. Residuals management including hazardous and solid waste. Prerequisite: CHEM 1601, PHYS 1601, MATH 2420. FALL. [3]

**CE 3700. Fluid Mechanics.** CE 3700. Fluid Mechanics. [Formerly CE 203] Physical properties of fluids, fluid statics; integral and differential equations of conservation of mass, energy, and momentum; principles of real fluid flows: boundary layer effects, flow through pipes, flow in open channels, drag forces on bodies. Emphasis on civil and environmental engineering applications. Credit not awarded for both CE 3700 and ME 3224. Prerequisite: ME 2190, MATH 2420. FALL, SUMMER. [3]

**CE 3700L. Fluid Mechanics Laboratory.** [Formerly CE 204] Team project-oriented course. Practical applications of fluid mechanics principles through laboratory exercises and field trips. Corequisite: CE 3700. FALL. [1]

**CE 3705. Water Resources Engineering.** [Formerly CE 227] Introduction to engineering of water resources and sewerage systems that control the quantity, quality, timing, and distribution of water to support human habitation and the needs of the environment. Closed conduit flow, open channel flow, surface hydrology, groundwater hydrology, and contaminant transport. Prerequisite: CHEM 1601, PHYS 1601/1602, MATH 2420, CE 3700. SPRING. [3]

**CE 3841. Directed Study.** [Formerly CE 200A] Directed individual study of a pertinent topic in civil and environmental engineering. May include literature review and analysis, analytical investigations, and/or experimental work. Prerequisite: Junior standing, completion of two CE courses, and one-page proposal approved by supervising faculty member and chair. FALL, SPRING, SUMMER. [Variable credit: 1-3 each semester]

**CE 3842. Directed Study.** [Formerly CE 200B] Continuation of CE 3841 in the same or another area of civil and environmental engineering. Prerequisite: CE 3841 and one-page proposal approved by supervising faculty member and chair. FALL, SPRING, SUMMER. [Variable credit: 1-3 each semester]

**CE 3843. Directed Study.** [Formerly CE 200C] Continuation of CE 3842 in the same or another area of civil and environmental engineering. Prerequisite: CE 3842 and one-page proposal approved by supervising faculty member and chair. FALL, SPRING, SUMMER. [Variable credit: 1-3 each semester]

**CE 3890. Special Topics.** [Formerly CE 299] [3]

**CE 4100. Geographic Information Systems (GIS).** [Formerly CE 259] Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and internet delivery. Includes GIS software utilization and individual projects. SPRING. [3]

**CE 4150. Energy Systems Engineering.** Physical principles of energy conversion. Energy sources and usage. Sustainability and carrying capacity. Systems tools and economics for energy systems. Energy distribution and storage. Future energy system design. Prerequisite: MATH 2300. SPRING. [3] (Not offered in 2016/17)

**CE 4200. Advanced Structural Steel Design.** [Formerly CE 293] Advanced topics in column and beam design: elastic and inelastic analysis and design of continuous beams, composite beams, torsion design, behavior and design of bolted and welded connections, structural planning and design of structural systems such as multistory buildings. Prerequisite: CE 3205. FALL. [3]

**CE 4205. Intelligent Transportation Systems.** [Formerly CE 262] Elements of intelligent transportation system (ITS) architecture. Survey of component systems. Analysis of potential impacts. Field operational tests, analysis methods, deployment initiatives and results. SPRING. [3]

**CE 4210. Advanced Reinforced Concrete Design.** [Formerly CE 294] Design and behavior of two-way slab systems. Yield line theory. Shear and torsion analysis and design. Serviceability requirements and control of deflections of reinforced concrete systems. Introduction to prestressed concrete. Prerequisite: CE 3205. SPRING. [3]

**CE 4211. Mechanics of Composite Materials.** [Formerly CE 295] Review of constituent materials (reinforcements, matrices, and interfaces) and fabrication processes. Prediction of properties of unidirectional and short fiber materials (micromechanics). Anisotropic elasticity (derivation of Hooke's law for anisotropic materials, macromechanics of laminated composites). Analysis of laminated composites based on Classical Lamination Theory. Behavior of composite beams and plates. Special topics (creep, fracture, fatigue, impact, and environmental effects). Prerequisite: CE 2205, MSE 1500, and MSE 1500L. SPRING. [3]

**CE 4240. Infrastructure Systems Engineering.** Systems-level approach to the infrastructure of the built environment. Elements of systems engineering. Case studies of infrastructure under duress. Smart infrastructure. Transportation, building, and water and wastewater supply and distribution systems. Infrastructure interdependencies and concepts of smart cities. Applications to infrastructure system design. FALL. [3] (Not offered in 2016/17)

**CE 4250. Foundation Analysis and Design.** [Formerly CE 251] Study of shallow and deep foundation elements and systems for civil engineering structures considering geotechnical, structural, and construction aspects. Corequisite: CE 3205. Prerequisite: CE 3250. SPRING. [3]

**CE 4300. Reliability and Risk Case Studies.** [Formerly CE 290] Review of historical events involving successes and failures in managing

system reliability and risk from a wide range of perspectives, including design, production, operations, organizational culture, human factors and exogenous events. Analysis of risk factors leading to event occurrence, as well as event consequences in terms of impacts to public health, safety, security and environmental protection. Evaluation of risk mitigation strategies based on achievable goals, technical and political feasibility, and economic impact. Cases drawn from natural disasters, industrial accidents, and intentional acts. Prerequisite: Junior standing. FALL. [3]

**CE 4400. Construction Project Management.** [Formerly CE 286] Introduction to the theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Broad overview of the construction project from conception through completion. Application of management practices including planning, directing, cost minimizing, resource allocation, and control of all aspects of construction operations and resources. Credit given for only one of ENGM 3700, CE 4400 or EECE 4950. Prerequisite: CE 3205. FALL. [3]

**CE 4401. Advanced Construction Project Management.** [Formerly CE 289] Current and critical issues in the construction industry, including best practices developed at the Construction Industry Institute (CII). Guest lecturers include representatives of the CII and visiting industry leaders. Prerequisite: CE 4400. FALL. [3]

**CE 4405. Construction Estimating.** [Formerly CE 287] Fundamentals of construction estimating. Estimation of material, labor, and equipment quantities, including costing and pricing of projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: CE 4400. FALL. [3]

**CE 4410. Construction Planning and Scheduling.** [Formerly CE 288] Fundamentals of construction planning and scheduling. Application of management practices including: process planning; directing, costing; resource allocation; and controlling all aspects of construction operations and resources, from pre-construction through operation and maintenance. Use of real-world examples and project scheduling software. Prerequisite: CE 4400. SPRING. [3]

**CE 4415. Construction Materials and Methods.** [Formerly CE 291] Implications of design realities, material specifications, code limitations, and regulations on the construction process. Natural and man-made materials, construction techniques, and other issues that impact quality, constructability, and life-cycle assessment. SUMMER. [3]

**CE 4420. Construction Law and Contracts.** [Formerly CE 292] Review of case studies involving successes and failures in legal principles and landmark cases relevant to civil engineering and construction. Contracts, torts, agency and professional liability, labor laws, insurance, expert testimony, arbitration, patents and copyrights, sureties, and ethics. Prerequisite: CE 4400. SPRING. [3]

**CE 4425. Building Information Modeling.** [Formerly CE 296] Generation and management of building data during its life cycle. Three-dimensional, real-time, dynamic modeling to increase productivity in building design and construction. Considerations of building geometry, spatial relationships, geographic information, and building components. Corequisite: CE 4400. FALL. [3]

**CE 4430. Building Systems and LEED.** [Formerly CE 298] Design and construction of mechanical, electrical, plumbing, and telecommunications systems in buildings. Leadership in Energy and Environmental Design (LEED) green Building Rating System(TM) building approach to sustainability. Prerequisite: CE 4400. SPRING. [3]

**CE 4500. Transportation Systems Design.** [Formerly CE 255] Geometric analysis of transportation ways with particular emphasis on horizontal and vertical curve alignment and superelevation. Design of highways, interchanges, intersections, and facilities for pedestrians, and air, rail, and public transportation. Prerequisite: CE 3501 or 3601. SPRING. [3]

**CE 4505. Urban Transportation Planning.** [Formerly CE 256] Analytical methods and the decision-making process. Transportation studies, travel characteristic analysis, and land-use implications are applied

to surface transportation systems. Emphasis is on trip generation, trip distribution, modal split, and traffic assignment. Planning processes in non-urban settings are also presented. Prerequisite: CE 3501 or CE 3601. SPRING [3]

**CE 4510. Traffic Engineering.** [Formerly CE 257] Analysis of the characteristics of traffic, including the driver, vehicle, volumes, capacities, congestion, roadway conditions, complete streets and accidents. Traffic regulations, markings, signing, signalization, and safety programs are also discussed. Prerequisite: CE 3501 or CE 3601. FALL. [3]

**CE 4900. Civil and Environmental Engineering Seminar.** [Formerly CE 252] A seminar designed to introduce students to current technical and professional issues through literature discussions, seminars by faculty and practicing engineers, and participation in panel discussions. Prerequisite: Senior or graduate standing or consent of instructor. FALL, SPRING. [1]

**CE 4950. Civil Engineering Design I.** [Formerly CE 248] A capstone design course for civil engineering students. Includes project conception, design, economic evaluations, safety, reliability, ethics, social and environmental impact, licensure, and government regulations. Projects may be interdisciplinary, competition-oriented, or traditional civil engineering projects. Prerequisite: CE 3100W. FALL [1].

**CE 4951. Civil Engineering Design II.** [Formerly CE 249] A continuation of CE 4950. The course involves an oral presentation and the submission of a final design report. Prerequisite: CE 4950. SPRING. [2]

**CE 4959. Senior Engineering Design Seminar.** Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: CE 4950. FALL. [1]

**CE 5100. Geographic Information Systems (GIS).** (Also listed as CE 4100) Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and internet delivery. Includes GIS software utilization and individual projects. No credit for students who have earned credit for 4100. SPRING. [3]

**CE 5150. Energy Systems Engineering.** CE 5150. Energy Systems Engineering. (Also listed as CE 4150) Physical principles of energy conversion. Energy sources and usage. Sustainability and carrying capacity. Systems tools and economics for energy systems. Energy distribution and storage. Future energy system design. SPRING. [3] (Not offered in 2016/17)

**CE 5200. Advanced Structural Steel Design.** (Also listed as CE 4200) Advanced topics in column and beam design including local buckling, composite beams, plate girders, and torsion design. Behavior and design of bolted and welded connections. Structural planning and design of structural systems such as multistory buildings including computer applications. No credit for students who have earned credit for 4200. FALL. [3]

**CE 5210. Advanced Reinforced Concrete Design.** (Also listed as CE 4210) Design and behavior of two-way slab systems. Yield line theory. Shear and torsion analysis and design. Serviceability requirements and control of deflections of reinforced concrete systems. Introduction to prestressed concrete. No credit for students who have earned credit for 4210. SPRING. [3]

**CE 5240. Infrastructure Systems Engineering.** (Also listed as CE 4240) Systems-level approach to the infrastructure of the built environment. Elements of systems engineering. Case studies of infrastructure under duress. Smart infrastructure. Transportation, building, and water and wastewater supply and distribution systems. Infrastructure interdependencies and concepts of smart cities. Applications to infrastructure system design. FALL. [3] (Not offered in 2016/17)

**CE 5250. Foundation Analysis and Design.** (Also listed as CE 4250) Study of shallow and deep foundation elements and systems for civil engineering structures. Soil exploration and site investigation. No credit for students who have earned credit for 4250. SPRING. [3]

**CE 5300. Reliability and Risk Case Studies.** (Also listed as CE 4300) Review of historical events involving successes and failures in managing system reliability and risk from a wide range of perspectives, including design, production, operations, organizational culture, human factors and exogenous events. Analysis of risk factors leading to event occurrence, as well as event consequences in terms of impacts to public health, safety, security and environmental protection. Evaluation of risk mitigation strategies based on achievable goals, technical and political feasibility, and economic impact. Cases drawn from natural disasters, industrial accidents, and intentional acts. No credit for students who have earned credit for CE 4300. FALL. [3]

**CE 5400. Construction Project Management.** (Also listed as CE 4400) Introduction to the theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Broad overview of the construction project from conception through completion. Application of management practices including planning, directing, cost minimizing, resource allocation, and control of all aspects of construction operations and resources. No credit for students who have earned credit for 4400. FALL. [3]

**CE 5401. Advanced Construction Project Management.** (Also listed as CE 4401) Current and critical issues in the construction industry, including best practices developed at the Construction Industry Institute (CII). Guest lecturers include representatives of the CII and visiting industry leaders. No credit for students who have earned credit for 4401. FALL. [3]

**CE 5405. Construction Estimating.** (Also listed as CE 4405) Fundamentals of construction estimating. Estimation of material, labor, and equipment quantities, including costing and pricing of projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: CE 5400. No credit for students who have earned credit for 4405. FALL. [3]

**CE 5410. Construction Planning and Scheduling.** (Also listed as CE 4410) Fundamentals of construction planning and scheduling. Application of management practices including: process planning; directing, costing; resource allocation; and controlling all aspects of construction operations and resources, from pre-construction through operation and maintenance. Use of real-world examples and project scheduling software. No credit for students who have earned credit for 4410. SPRING. [3]

**CE 5415. Construction Materials and Methods.** (Also listed as CE 4415) Implications of design realities, material specifications, code limitations, and regulations on the construction process. Natural and man-made materials, construction techniques, and other issues that impact quality, constructability, and life-cycle assessment. No credit for students who have earned credit for 4415. SUMMER. [3]

**CE 5420. Construction Law and Contracts.** (Also listed as CE 4420) Review of case studies involving successes and failures in legal principles and landmark cases relevant to civil engineering and construction. Contracts, torts, agency and professional liability, labor laws, insurance, expert testimony, arbitration, patents and copyrights, sureties, and ethics. No credit for students who have earned credit for 4420. SPRING. [3]

**CE 5425. Building Information Modeling.** (Also listed as CE 4425) Generation and management of building data during its life cycle. Three-dimensional, real-time, dynamic modeling to increase productivity in building design and construction. Considerations of building geometry, spatial relationships, geographic information, and building components. No credit for students who have completed 4425. FALL. [3]

**CE 5430. Building Systems and LEED.** (Also listed as CE 4430) Design and construction of mechanical, electrical, plumbing, and telecommunications systems in buildings. Leadership in Energy and Environmental Design (LEED) green Building Rating System(TM) building approach to sustainability. No credit for students who have earned credit for 4430. SPRING. [3]

**CE 5500. Transportation System Design.** (Also listed as CE 4500) Geometric analysis of transportation ways with particular emphasis

on horizontal and vertical curve alignment. Design of highways, interchanges, intersections, and facilities for air, rail, and public transportation. No credit for students who have earned credit for 4500. SPRING. [3]

**CE 5505. Urban Transportation Planning.** (Also listed as CE 4505) Analytical methods and the decision-making process. Transportation studies, travel characteristic analysis, and land-use implications are applied to surface transportation systems. Emphasis is on trip generation, trip distribution, modal split, and traffic assignment. Computerized planning programs are used. No credit for students who have earned credit for 4505. SPRING. [3]

**CE 5510. Traffic Engineering.** (Also listed as CE 4510) Analysis of the characteristics of traffic, including the driver, vehicle, volumes, speeds, capacities, roadway conditions, and accidents. Traffic regulation, control, signing, signalization, and safety programs are also discussed. No credit for students who have earned credit for 4510. FALL. [3]

**CE 5999. Special Topics.** (Also listed as CE 3890) No credit for students who have earned credit for 3890. [3]

**CE 6200. Continuum Mechanics.** [Formerly CE 301] Mathematical preliminaries: tensor algebra, tensor calculus, coordinate transformation, principal values and directions. Kinematics of continuum: motion and deformation, infinitesimal and finite strain theory, balance of mass. Stress and integral formulations: traction on planes, stress invariants and failure theories, Piola-Kirchhoff stress tensors, balance of momentum, stress power. Elastic solid: linear isotropic and anisotropic elasticity, engineering material constants, plane elastic waves, non-linear isotropic elasticity. FALL. [3].

**CE 6205. Theory of Inelasticity.** [Formerly CE 302] Physical mechanisms of deformation and failure. Modern theories of plasticity, viscoplasticity and continuum damage mechanics. Thermodynamics of plasticity and damage processes. Numerical and computational aspects of inelastic deformation mechanisms in solids and structures. SPRING. [3]

**CE 6210. Finite Element Analysis.** [Formerly CE 307] Discrete modeling of problems of the continua. Mathematical basis of finite element method-weighted residual and variational concepts. Finite element formulations; displacement, force, and mixed methods. 1-D problems of the continua and finite element solution-C0 and C1 elements, eigenvalue and transient problems. Error checks and control. Mapping, shape functions, numerical quadrature, and solution of equations. Formulation of 2-D problems (single and multi-field)-mapping and shape functions, triangular and quad elements with straight or curved boundaries. 3-D elements, singular problems, buckling, and nonlinear problems. Error estimation and quality control. Computer implementation. Commercial packages. Prerequisite: MATH 2410, MATH 3620. FALL. [3]

**CE 6212. Advanced Computational Mechanics.** [Formerly CE 308] Basics of nonlinear mechanics - geometric and material nonlinearities. Discrete Lagrangian, Eulerian and other formulations. Nonlinear material models. Numerical solution algorithms in space and time. Solution of nonlinear (second-order and higher) problems. Multi-disciplinary problems. Error estimation and adaptive model improvement. Introduction to multi-scale modeling and atomistic/continuum coupling. Prerequisite: CE 6210. SPRING. [3]

**CE 6215. Structural Dynamics and Control.** [Formerly CE 309] Analysis of single- and multi-degree-of-freedom systems. Modal superposition method. Time and frequency domain analyses. Numerical methods and nonlinear dynamic analysis. Application to structures subject to earthquake and impact forces. Elements of feedback control systems. Control of lumped parameter systems. Active, passive, and hybrid mass dampers. Application to simple building and bridge structures. SPRING. [3]

**CE 6300. Probabilistic Methods in Engineering Design.** [Formerly CE 310] Applications of probabilistic methods in the analysis and synthesis of engineering systems. Review of basic probability concepts, random variables and distributions, modeling and quantification of uncertainty, testing the validity of assumed models, linear regression and correlation analyses, Monte Carlo simulation, reliability analysis and reliability-based design. Prerequisite: MATH 2410. FALL. [3]

**CE 6305. Engineering Design Optimization.** [Formerly CE 311] Methods for optimal design of engineering systems. Optimization under uncertainty, reliability-based design optimization, robust design, multidisciplinary problems, multi-objective optimization. Discrete and continuous design variables, advanced numerical algorithms, and formulations and strategies for computational efficiency. Practical applications and term projects in the student's area of interest. Prerequisite: MATH 4630, MATH 4620 or CE 6300. [3]

**CE 6310. Uncertainty Quantification.** [Formerly CE 313] Computational methods for analysis and design of modern engineering systems under uncertainty. Emphasis on epistemic uncertainty due to data and models. Topics include stochastic finite elements; time-dependent reliability; Bayesian methods and networks; surrogate modeling; advanced simulation; global sensitivity analysis; model verification, validation, and calibration; and optimization under uncertainty. Applications to practical engineering systems. Prerequisite: CE 6300. SPRING. [3]

**CE 6313. Multiscale Modeling.** [Formerly CE 314] State-of-the-art and emerging multiscale computational methods for modeling of mechanics, transport, and materials phenomena. Principles of information transfer between multiple spatial and temporal scales, including atomistic-to-continuum coupling, continuum-to-continuum coupling, and bridging of time scales. Enrichment methods including generalized finite elements, partition of unity, variational multiscale methods. FALL. [3]

**CE 6318. Prestressed Concrete.** [Formerly CE 318] Behavior and design of statically determinate prestressed concrete structures under bending moment, shear, torsion, and axial load effects. Design of statically determinate prestressed structures such as continuous beams, frames, slabs and shells. Creep and shrinkage effects and deflections of prestressed concrete structures. Application to the design and construction of bridges and buildings. Prerequisite: CE 3205. [3]

**CE 6351. Public Transportation Systems.** [Formerly CE 351] Comprehensive study of public transportation, with emphasis on planning, management, and operations; paratransit, ridesharing, and rural public transportation systems. Prerequisite: CE 4505. SPRING. [3]

**CE 6353. Airport Planning and Design.** [Formerly CE 353] Integration and application of the principles of airport master planning from the beginning stages of site selection through actual design of an airport facility. Specific study topics address demand forecasting, aircraft characteristics, capacity analyses, and geometric design of runways, terminals, and support facilities. Prerequisite: CE 3601. [3]

**CE 6355. Advanced Transportation Design.** [Formerly CE 355] In-depth view of the transportation design process. Complex transportation design problems and solutions, with the use of computer-based analytical design tools. Comprehensive design projects. Prerequisite: CE 4500. SPRING [3]

**CE 6356. Advanced Transportation Planning.** [Formerly CE 356] A continuation of the concepts from CE 4505, with emphasis on analytical techniques used in forecasting travel. Use of computer-based models, along with transportation and energy contingency planning methods. Prerequisite: CE 4505. SPRING [3]

**CE 6357. Theory of Traffic Flow.** [Formerly CE 357] A study of traffic flow from the perspective of probability as applied to highway, intersection and weaving capacities. Discrete and continuous flow, vehicle distributions, queuing, and simulation. Prerequisite: CE 4510. [3]

**CE 6359. Emerging Information Systems Applications.** [Formerly CE 359] Role of emerging information systems technologies in improving productivity and efficiency and in managing engineering operations. Design of integrated approaches to enhance the speed, accuracy, reliability, and quantity of information available for decision support. Emphasis on case studies of innovative applications in transportation and manufacturing, leading to individual and group projects requiring new product development. Prerequisite: Background in transportation or manufacturing operations. FALL. [3]

**CE 7899. Master of Engineering Project.** [Formerly CE 389]

**CE 7999. Master's Thesis Research.** [Formerly CE 369]

**CE 8000. Individual Study of Civil Engineering Problems.** [Formerly CE 325A] Literature review and analysis of special problems under faculty supervision. FALL, SPRING, SUMMER. [1-4 each semester]

**CE 8001. Individual Study of Civil Engineering Problems.** [Formerly CE 325B] Literature review and analysis of special problems under faculty supervision. FALL, SPRING, SUMMER. [1-4 each semester]

**CE 8002. Individual Study of Civil Engineering Problems.** [Formerly CE 325C] Literature review and analysis of special problems under faculty supervision. FALL, SPRING, SUMMER. [1-4 each semester]

**CE 8300. Reliability and Risk Engineering Seminar.** [Formerly CE 371A] Perspectives on reliability and risk assessment and management of multi-disciplinary engineering systems. Topics on infrastructure and environmental systems, mechanical, automotive, and aerospace systems; network systems (power distribution, water and sewage systems, transportation etc.); manufacturing and construction; and electronic and software systems. FALL, SPRING. [1]

**CE 8301. Reliability and Risk Engineering Seminar.** [Formerly CE 371B] Seminars by expert speakers provide a wide range of perspectives on reliability and risk assessment and management of multidisciplinary engineering systems. Topics on infrastructure and environmental systems; mechanical, automotive, and aerospace systems; network systems (power distribution, water and sewage systems, transportation, etc.); manufacturing and construction; and electronic and software systems. FALL, SPRING. [1]

**CE 8999. Non-Candidate Research.** [Formerly CE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

**CE 9999. Ph.D. Dissertation Research.** [Formerly CE 399]

## Environmental Engineering

**ENVE 3610. Sustainable Development.** [Formerly ENVE 220A] Quantitative investigation of the role of adequate and renewable resources for continual economic development. Past and present resource challenges, influences of indigenous, national, and international cultures, land use practices, social policy, and economic strategies on infrastructure development. Future challenges posed by climate change, and how market- and government-based policies may be applied in conditions of uncertainty to encourage sustainable development. Intended to be followed by ENVE 3611. SPRING. [3]

**ENVE 3611. Sustainable Development Field Experience.** [Formerly ENVE 220B] Through lectures, research projects, and service-learning opportunities, students will reflect on themes from ENVE 3610 and apply them to work in the field. Students will design and conduct quantitative-oriented research projects in collaboration with faculty mentors and international partners. Prerequisite: ENVE 3610. SUMMER. [1-3]

**ENVE 3612. Sustainable Development Research.** [Formerly ENVE 220C] A quantitative, project- and research-based seminar drawing on student experiences and learning in ENVE 3610 and ENVE 3611. Prerequisite: ENVE 3611. FALL. [3]

**ENVE 4305. Enterprise Risk Management.** [Formerly ENVE 296] Development of an organization-wide risk management program for protecting human health, the environment and business continuity. Focus on defining an all-hazards risk management process and program implementation, performing risk assessments, determining and selecting appropriate risk reduction strategies, and influencing risk management decisions internally and externally. Applications drawn from natural disasters, man-made accidents and intentional acts. Prerequisite: Senior standing. SPRING. [3]

**ENVE 4600. Environmental Chemistry.** [Formerly ENVE 271] Theoretical aspects of physical, organic, and inorganic chemistry applied to environmental engineering. Estimation of chemical parameters based on thermodynamic and structural activity relationships, kinetics of

chemical reactions, equilibrium processes in the environment, including the carbonate system, metal complexation and precipitation. Prerequisite: CHEM 1602. FALL. [3]

**ENVE 4605. Environmental Thermodynamics, Kinetics, and Mass Transfer.** [Formerly ENVE 270] Examination of fundamental environmental processes and phenomena. Uses of equilibrium phenomena, process rate and mass transport phenomena to solve a broad range of environmental problems. Prerequisite: CHEM 1602, MATH 2420, CE 3600. SPRING. [3]

**ENVE 4610. Biological Processes in Environmental Systems.** [Formerly ENVE 272] Principles of biology and their application to wastewater treatment processes with emphasis on microbial ecology, bioenergetics, and the role of chemical structure in biodegradability. Utilization kinetics of inhibitory and non-inhibitory organic compounds. Biological process analysis and design (aerobic and anaerobic) for municipal and industrial wastewaters, using a mass balance approach. SPRING. [3]

**ENVE 4615. Environmental Assessments.** [Formerly ENVE 264] Design and conduct of environmental assessments to evaluate risks posed by infrastructure systems or environmental contamination. Impact analyses for sources, infrastructure modifications, due diligence environmental audits, and contaminated site remedial investigations. Prerequisite: Senior standing. FALL. [3]

**ENVE 4620. Environmental Characterization and Analysis.** [Formerly ENVE 273] Acquisition and interpretation of environmental data. Principles of chemical measurement, sample collection and sample program design; laboratory safety and good laboratory practices; analytical instrumentation and methods; quality assurance and quality control; and statistical interpretation of data. Hands-on experience through demonstrations featuring state-of-the-art analytical instrumentation. Prerequisite: CE 3600, ENVE 4600. SPRING. [3]

**ENVE 4625. Environmental Separations Processes.** [Formerly ENVE 277 and ENVE 4716] Fundamentals and applications of separations processes relevant to water and wastewater treatment and other environmental systems. Topics include coagulation/flocculation, sedimentation, granular filtration; advanced separation processes such as various membrane processes, absorption, ion exchange, thermally driven separations, and electrically driven separations including electrodialysis and capacitive deionization. SPRING. [3]

**ENVE 4700. Energy and Water Resources.** [Formerly ENVE 254] Scientific, technological, philosophical, and social issues surrounding approaches to carbon-based energy and alternative energy resources, management of carbon through sequestration, supplying and treating water for agriculture, communities, and industry, and changing climate impacts on regional distribution of water resources. SPRING. [3]

**ENVE 4705. Physical Hydrology.** [Formerly ENVE 252] Development of fundamental bases of hydrological processes. Land-atmosphere processes, surface-water flows, soil moisture dynamics, and ground-water flows. Exposition of physical principles, their embodiment in mathematical models, and their use in interpreting observations in the field and laboratory. Prerequisite: CE 3700 or ME 3224 or CHBE 3300 or EES 4550. FALL. [3]

**ENVE 4710. Hydrology.** [Formerly ENVE 262] The hydrologic cycle, study of precipitation, evapotranspiration, hydrometeorology, stream flow, flood flow, flood routing, storm sewer design, detention basin design, and water quality. Prerequisite: CE 3700, CE 3705. FALL. [3]

**ENVE 4715. Groundwater Hydrology.** [Formerly ENVE 276] The occurrence and flow of ground water. Basic concepts of the effects of varying permeability and capillarity on seepage flow. Flow toward wells, through dikes, and beneath dams. Prerequisite: MATH 2420, CE 3700. SPRING. [3]

**ENVE 4720. Surface Water Quality Modeling.** [Formerly ENVE 274] Analysis of physical, chemical, biological, and physiological contaminants in streams, lakes, and estuaries, and surface water/groundwater interfaces. Analytical and numerical modeling techniques. One- and two-dimension computer simulation of surface water quality. Prerequisite: ENVE 4605. SPRING. [3]

**ENVE 4800. Introduction to Nuclear Environmental Engineering.** [Formerly ENVE 285] The nuclear fuel cycle and environmental and societal impacts associated with its traditional implementation. Technical and programmatic challenges associated with fuel production, and waste management including processing, storage, transportation, decontamination, decommissioning, and environmental restoration. Technologies and approaches for reducing impacts of the nuclear fuel cycle. Prerequisite: Senior or graduate standing. SPRING. [3]

**ENVE 5305. Enterprise Risk Management.** (Also listed as ENVE 4305) Development of an organization-wide risk management program for protecting human health, the environment and business continuity. Focus on defining an all-hazards risk management process and program implementation, performing risk assessments, determining and selecting appropriate risk reduction strategies, and influencing risk management decisions internally and externally. Applications drawn from natural disasters, man-made accidents and intentional acts. No credit for students who have earned credit for ENVE 4305. SPRING. [3]

**ENVE 5600. Environmental Chemistry.** (Also listed as ENVE 4600) Theoretical aspects of physical, organic, and inorganic chemistry applied to environmental engineering. Estimation of chemical parameters based on thermodynamic and structural activity relationships, kinetics of chemical reactions, equilibrium processes in the environment, including the carbonate system, metal complexation and precipitation. No credit for students who have earned credit for 4600. FALL. [3]

**ENVE 5605. Environmental Thermodynamics, Kinetics, and Mass Transfer.** (Also listed as ENVE 4605) Examination of fundamental environmental processes and phenomena that provide the analytical tools necessary to solve a broad range of environmental problems. These tools include equilibrium phenomena, process rate and mass transport phenomena. No credit for students who have earned credit for 4605. SPRING. [3]

**ENVE 5610. Biological Processes in Environmental Systems.** (Also listed as ENVE 4610) Principles of biology and their application to wastewater treatment processes with emphasis on microbial ecology, bioenergetics, and the role of chemical structure in biodegradability. Utilization kinetics of inhibitory and non-inhibitory organic compounds. Biological process analysis and design (aerobic and anaerobic) for municipal and industrial wastewaters, using a mass balance approach. No credit for students who have earned credit for ENVE 4610. SPRING. [3]

**ENVE 5615. Environmental Assessments.** (Also listed as ENVE 4615) Design and conduct of environmental assessments to evaluate risks posed by infrastructure systems or environmental contamination. Impact analyses for sources, infrastructure modifications, due diligence environmental audits, and contaminated site remedial investigations. No credit for students who have earned credit for 4615. FALL. [3]

**ENVE 5620. Environmental Characterization and Analysis.** (Also listed as ENVE 4620) Acquisition and interpretation of environmental data. Principles of chemical measurement, sample collection and sample program design; laboratory safety and good laboratory practices; analytical instrumentation and methods; quality assurance and quality control; and statistical interpretation of data. Hands-on experience through demonstrations featuring state-of-the-art analytical instrumentation. No credit for students who have earned credit for 4620. SPRING. [3]

**ENVE 5625. Environmental Separations Processes.** (Also listed as ENVE 4625) Fundamentals and applications of separations processes relevant to water and wastewater treatment and other environmental systems. Topics include coagulation/flocculation, sedimentation, granular filtration; advanced separation processes such as various membrane processes, absorption, ion exchange, thermally driven separations, and electrically driven separations including electrodialysis and capacitive deionization. No credit for students who have earned credit for ENVE 4625. SPRING. [3]

**ENVE 5700. Energy and Water Resources.** (Also listed as ENVE 4700) Scientific, technological, philosophical, and social issues surrounding approaches to carbon-based energy and alternative energy resources, management of carbon through sequestration, supplying and treating

water for agriculture, communities, and industry, and changing climate impacts on regional distribution of water resources. No credit for students who have earned credit for 4700. SPRING. [3]

**ENVE 5705. Physical Hydrology.** (Also listed as ENVE 4705) Development of fundamental bases of hydrological processes. Land-atmosphere processes, surface water flows, soil moisture dynamics, and groundwater flows. Exposition of physical principles, their embodiment in mathematical models, and their use in interpreting observations in the field and laboratory. No credit for students who have earned credit for 4705. FALL. [3]

**ENVE 5710. Hydrology.** (Also listed as ENVE 4710) The hydrologic cycle, study of precipitation, evapotranspiration, hydrometeorology, stream flow, flood flow, flood routing, storm sewer design, detention basin design, and water quality. No credit for students who have earned credit for 4710. FALL. [3]

**ENVE 5715. Groundwater Hydrology.** (Also listed as ENVE 4715) The occurrence and flow of ground water. Basic concepts of the effects of varying permeability and capillarity on seepage flow. Flow toward wells, through dikes, and beneath dams. No credit for students who have earned credit for 4715. SPRING. [3]

**ENVE 5720. Surface Water Quality Modeling.** (Also listed as ENVE 4720) Analysis of physical, chemical, biological, and physiological contaminants in streams, lakes, and estuaries, and surface water/groundwater interfaces. Analytical and numerical modeling techniques. One- and two-dimensional computer simulation of surface water quality. No credit for students who have earned credit for 4720. SPRING. [3]

**ENVE 5800. Introduction to Nuclear Environmental Engineering.** (Also listed as ENVE 4800) The nuclear fuel cycle and environmental and societal impacts associated with its traditional implementation. Technical and programmatic challenges associated with fuel production, and waste management including processing, storage, transportation, decontamination, decommissioning, and environmental restoration. Technologies and approaches for reducing impacts of the nuclear fuel cycle. No credit for students who have earned credit for 4800. SPRING. [3]

**ENVE 6800. Nuclear Facilities Life Cycle Engineering.** [Formerly ENVE 330] The life cycle (including siting, licensing, construction, operations and decommissioning) of the nuclear facilities that comprise the nuclear fuel cycle—from mining uranium ore through the potential recycling of used nuclear fuel. SPRING. [3]

**ENVE 6805. Storage, Treatment and Disposal of Radioactive Waste.** [Formerly ENVE 332] Evolution of current domestic and international approaches, including waste forms, classification, storage and disposal locations, and environmental and safety assessments. FALL. [3]

**ENVE 7531. Nuclear Chemistry and Processes.** [Formerly ENVE 331] Chemistry and chemical processing of the actinides and important fission products and byproducts. Development of nuclear chemical engineering processes for these materials. SPRING. [3]

**ENVE 7533. Nuclear Process Safety.** [Formerly ENVE 333] Approaches for evaluating the safety of nuclear radiochemical processing systems. Safety analysis practices from the chemical industry, the nuclear power community, and the United States nuclear weapons complex, and other quantitative and qualitative risk assessment methods. FALL. [3]

**ENVE 7534. Nuclear Environmental Regulation, Law and Practice.** [Formerly ENVE 334] Environmental laws and regulations governing radionuclides and radioactive waste, including those concerning hazardous chemicals and wastes and those impacting commercial nuclear fuel cycle facilities and former nuclear weapons and materials sites. Interplay between regulatory agencies such as the US Nuclear Regulatory Commission, the US Environmental Protection Agency, and the states. Self-regulation of activities by the U.S. Department of Energy. SUMMER. [3]

**ENVE 7899. Master of Engineering Project.** [Formerly ENVE 389]

**ENVE 7999. Master's Thesis Research.** [Formerly ENVE 369]

**ENVE 8000. Individual Study.** [Formerly ENVE 325A] Literature review and analysis, or laboratory investigation of special problems under faculty supervision. FALL, SPRING, SUMMER. [Variable credit: 1-4 each semester]

**ENVE 8001. Individual Study.** [Formerly ENVE 325B] Literature review and analysis, or laboratory investigation of special problems under faculty supervision. FALL, SPRING, SUMMER. [Variable credit: 1-4 each semester]

**ENVE 8002. Individual Study.** [Formerly ENVE 325C] Literature review and analysis, or laboratory investigation of special problems under faculty supervision. FALL, SPRING, SUMMER. [Variable credit: 1-4 each semester]

**ENVE 8999. Non-Candidate Research.** [Formerly ENVE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

**ENVE 9999. Ph.D. Dissertation Research.** [Formerly ENVE 399]

## Computer Science

**CS 1101. Programming and Problem Solving.** [Formerly CS 101] An intensive introduction to algorithm development and problem solving on the computer. Structured problem definition, top down and modular algorithm design. Running, debugging, and testing programs. Program documentation. FALL, SPRING. [3]

**CS 1103. Introductory Programming for Engineers and Scientists.** [Formerly CS 103] An introduction to problem solving on the computer. Intended for students other than computer science and computer engineering majors. Methods for designing programs to solve engineering and science problems using MATLAB. Generic programming concepts. FALL, SPRING. [3]

**CS 1151. Computers and Ethics.** [Formerly CS 151] Analysis and discussion of problems created for society by computers, and how these problems pose ethical dilemmas to both computer professionals and computer users. Topics include computer crime, viruses, software theft, ethical implications of life-critical systems. FALL, SPRING. [3]

**CS 2201. Program Design and Data Structures.** [Formerly CS 201] Continuation of CS 1101. The study of elementary data structures, their associated algorithms and their application in problems; rigorous development of programming techniques and style; design and implementation of programs with multiple modules, using good data structures and good programming style. Prerequisite: CS 1101 FALL, SPRING. [3]

**CS 2204. Program Design and Data Structures for Scientific Computing.** [Formerly CS 204] Data Structures and their associated algorithms in application to computational problems in science and engineering. Time and memory complexity; dynamic memory structures; sorting and searching; advanced programming and program-solving strategies; efficient software library use. Prerequisite: CS 1101 or 1103 SPRING. [3]

**CS 2212. Discrete Structures.** [Formerly CS 212] A broad survey of the mathematical tools necessary for an understanding of computer science. Topics covered include an introduction to sets, relations, functions, basic counting techniques, permutations, combinations, graphs, recurrence relations, simple analysis of algorithms, O-notation, Boolean algebra, propositional calculus, and numeric representation. Prerequisite: A course in computer science or two semesters of calculus. FALL, SPRING. [3]

**CS 2231. Computer Organization.** [Formerly CS 231] The entire hierarchical structure of computer architecture, beginning at the lowest level with a simple machine model (e.g., a simple von Neumann machine). Processors, process handling, IO handling, and assembler concepts. Graduate credit not given for computer science majors. Prerequisite: CS 2201; corequisite: EECE 2116, 2116L. FALL, SPRING. [3]



**CS 3250. Algorithms.** [Formerly CS 250] Advanced data structures, systematic study and analysis of important algorithms for searching; sorting; string processing; mathematical, geometrical, and graph algorithms, classes of P and NP, NP-complete and intractable problems. Prerequisite: CS 2201, CS 2212. FALL, SPRING. [3]

**CS 3251. Intermediate Software Design.** [Formerly CS 251] High quality development and reuse of architectural patterns, design patterns, and software components. Theoretical and practical aspects of developing, documenting, testing, and applying reusable class libraries and object-oriented frameworks using object-oriented and component-based programming languages and tools. Prerequisite: CS 2201. FALL, SPRING [3]

**CS 3252. Theory of Automata, Formal Languages, and Computation.** [Formerly CS 252] Finite-state machines and regular expressions. Context-free grammars and languages. Pushdown automata. Turing machines. Undecidability. The Chomsky hierarchy. Computational complexity. Prerequisite: CS 2212. SPRING. [3]

**CS 3258. Introduction to Computer Graphics.** [Formerly CS 258] Featuring 2D rendering and image-based techniques, 2D and 3D transformations, modeling, 3D rendering, graphics pipeline, ray-tracing, and texture-mapping. Prerequisite: MATH 2410, 2400, 2600 or 2501; CS 3251. FALL. [3]

**CS 3259. Project in Computer Animation Design and Technology.** [Formerly CS 259] Introduction to the principles and techniques of computer animation. Students work in small groups on the design, modeling, animation, and rendering of a small computer animation project. Topics include storyboarding, camera control, skeletons, inverse kinematics, splines, keyframing, motion capture, dynamic simulation, particle systems, facial animation, and motion perception. Prerequisite: CS 2201; one of MATH 2410, 2400, 2600, or 2501. FALL. [3]

**CS 3265. Introduction to Database Management Systems.** [Formerly CS 265] Logical and physical organization of databases. Data models and query languages, with emphasis on the relational model and its semantics. Concepts of data independence, security, integrity, concurrency. Prerequisite: CS 2201. [3]

**CS 3270. Programming Languages.** [Formerly CS 270] General criteria for design, implementation, and evaluation of programming languages. Historical perspective. Syntactic and semantic specification, compilations, and interpretation processes. Comparative studies of data types and data control, procedures and parameters, sequence control, nesting, scope and storage management, run-time representations. Non-standard languages, problem-solving assignments in a laboratory environment. Prerequisite: CS 2231. FALL, SPRING. [3]

**CS 3274. Modeling and Simulation.** [Formerly CS 274] General theory of modeling and simulation of a variety of systems: physical processes, computer systems, biological systems, and manufacturing processes. Principles of discrete-event, continuous, and hybrid system modeling, simulation algorithms for the different modeling paradigms, methodologies for constructing models of a number of realistic systems, and analysis of system behavior. Computational issues in modeling and analysis of systems. Stochastic simulations. Prerequisite: CS 2201. [3]

**CS 3276. Compiler Construction.** [Formerly CS 276] Review of programming language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions and statements. Organization of a compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design. Use of a high-level language to write a complete compiler. Prerequisite: CS 2231. [3]

**CS 3281. Principles of Operating Systems I.** [Formerly CS 281] Resource allocation and control functions of operating systems. Scheduling of processes and processors. Concurrent processes and primitives for their synchronization. Use of parallel processes in designing operating system subsystems. Methods of implementing parallel processes on conventional computers. Virtual memory, paging, protection of shared

and non-shared information. Structures of data files in secondary storage. Security issues. Case studies. Prerequisite: CS 2231, CS 3251. FALL, SPRING. [3]

**CS 3282. Principles of Operating Systems II.** [Formerly CS 282] Projects involving modification of a current operating system. Lectures on memory management policies, including virtual memory. Protection and sharing of information, including general models for implementation of various degrees of sharing. Resource allocation in general, including deadlock detection and prevention strategies. Introduction to operating system performance measurement, for both efficiency and logical correctness. Two hours lecture and one hour laboratory. Prerequisite: CS 3281. [3]

**CS 3860. Undergraduate Research.** [Formerly CS 240A] Open to qualified majors with consent of instructor and adviser. No more than 6 hours may be counted towards the computer science major. Prerequisite: CS 2231. FALL, SPRING. [Variable credit: 1-3 each semester, not to exceed a total of 6]

**CS 3861. Undergraduate Research.** [Formerly CS 240B] Open to qualified majors with consent of instructor and adviser. No more than 6 hours may be counted towards the computer science major. Prerequisite: CS 2231. FALL, SPRING. [Variable credit: 1-3 each semester, not to exceed a total of 6]

**CS 3890. Special Topics in Computer Science.** [Formerly CS 242] [Variable credit: 1-3]

**CS 3891. Special Topics.** [Formerly CS 291] [Variable credit: 1-3 each semester] (Offered on demand)

**CS 3892. Special Topics.** [Formerly CS 292] [Variable credit: 1-3 each semester] (Offered on demand)

**CS 4260. Artificial Intelligence.** [Formerly CS 260] Introduction to the principles and programming techniques of artificial intelligence. Strategies for searching, representation of knowledge and automatic deduction, learning, and adaptive systems. Survey of applications. Prerequisite: CS 3250. FALL. [3]

**CS 4266. Topics in Big Data.** Principles and practices of big data processing and analytics. Data storage databases and data modeling techniques, data processing and querying, data analytics and applications of machine learning using these systems. Prerequisite: CS 3251. SPRING. [3]

**CS 4269. Project in Artificial Intelligence.** [Formerly CS 269] Students work in small groups on the specification, design, implementation, and testing of a sizeable AI software project. Projects (e.g., an "intelligent" game player) require that students address a variety of AI subject areas, notably heuristic search, uncertain reasoning, planning, knowledge representation, and learning. Class discussion highlights student progress, elaborates topics under investigation, and identifies other relevant topics (e.g., vision) that the project does not explore in depth. Prerequisite: CS 4260. SPRING. [3]

**CS 4278. Principles of Software Engineering.** [Formerly CS 278] The nature of software. The object-oriented paradigm. Software life-cycle models. Requirements, specification, design, implementation, documentation, and testing of software. Object-oriented analysis and design. Software maintenance. Prerequisite: CS 3251. FALL. [3]

**CS 4279. Software Engineering Project.** [Formerly CS 279] Students work in teams to specify, design, implement, document, and test a nontrivial software project. The use of CASE (Computer Assisted Software Engineering) tools is stressed. Prerequisite: CS 4278. SPRING. [3]

**CS 4283. Computer Networks.** [Formerly CS 283] Computer communications. Network (Internet) architecture. Algorithms and protocol design at each layer of the network stack. Cross-layer interactions and performance analysis. Network simulation tools. Lab and programming assignments. Credit given for only one of CS 4283 or EECE 4371. Prerequisite: CS 3281 or EECE 4376. [3]

**CS 4284. Computer Systems Analysis.** [Formerly CS 284] Techniques for evaluating computer system performance with emphasis upon application. Topics include measurement and instrumentation techniques, benchmarking, simulation techniques, elementary queuing models, data analysis, operation analysis, performance criteria, case studies. Project involving a real computer system. Prerequisite: CS 3281. [3]

**CS 4285. Network Security.** [Formerly CS 285] Principles and practice of network security. Security threats and mechanisms. Cryptography, key management, and message authentication. System security practices and recent research topics. Prerequisite: CS 4283. [3]

**CS 4287. Principles of Cloud Computing.** Fundamental concepts of cloud computing, different service models, techniques for resource virtualization, programming models, management, mobile cloud computing, recent advances, and hands-on experimentation. Prereq: CS 3281. [3]

**CS 4288. Web-based System Architecture.** Core concepts necessary to architect, build, test, and deploy complex web-based systems; analysis of key domain requirements in security, robustness, performance, and scalability. Prerequisite: CS 3251. FALL. [3]

**CS 4959. Computer Science Project Seminar.** [Formerly CS 297] Elements of professional engineering practice, professional education and lifelong learning, intellectual property and software patents, open source and crowd source software development, liability, soft risk safety and security, privacy issues, interdisciplinary teams and team tools, professional organization, careers, entrepreneurship, human computer interaction. Prerequisite: CS 3281. FALL. [1]

**CS 5250. Algorithms.** (Also listed as CS 3250) Advanced data structures, systematic study and analysis of important algorithms for searching; sorting; string processing; mathematical, geometrical, and graph algorithms, classes of P and NP, NP-complete and intractable problems. No credit for students who have earned credit for 3250. FALL, SPRING. [3]

**CS 5251. Intermediate Software Design.** (Also listed as CS 3251) High quality development and reuse of architectural patterns, design patterns, and software components. Theoretical and practical aspects of developing, documenting, testing, and applying reusable class libraries and object-oriented frameworks using object-oriented and component-based programming languages and tools. No credit for students who have earned credit for 3251. FALL, SPRING [3]

**CS 5252. Theory of Automata, Formal Languages, and Computation.** (Also listed as CS 3252) Finite-state machines and regular expressions. Context-free grammars and languages. Pushdown automata. Turing machines. Undecideability. The Chomsky hierarchy. Computational complexity. No credit for students who have earned credit for 3252. SPRING. [3]

**CS 5258. Introduction to Computer Graphics.** (Also listed as CS 3258) Featuring 2D rendering and image-based techniques, 2D and 3D transformations, modeling, 3D rendering, graphics pipeline, ray-tracing, and texture-mapping. No credit for students who have earned credit for 3258. FALL. [3]

**CS 5259. Project in Computer Animation Design and Technology.** (Also listed as CS 3259) Introduction to the principles and techniques of computer animation. Students work in small groups on the design, modeling, animation, and rendering of a small computer animation project. Topics include storyboarding, camera control, skeletons, inverse kinematics, splines, keyframing, motion capture, dynamic simulation, particle systems, facial animation, and motion perception. No credit for students who have earned credit for 3259. FALL. [3]

**CS 5260. Artificial Intelligence.** (Also listed as CS 4260) Introduction to the principles and programming techniques of artificial intelligence. Strategies for searching, representation of knowledge and automatic deduction, learning, and adaptive systems. Survey of applications. No credit for students who have earned credit for 4260. FALL. [3]

**CS 5265. Introduction to Database Management Systems.** (Also listed as CS 3265) Logical and physical organization of databases. Data models and query languages, with emphasis on the relational model and its semantics. Concepts of data independence, security, integrity, concurrency. No credit for students who have earned credit for 3265. [3]

**CS 5266. Topics in Big Data.** Principles and practices of big data processing and analytics. Data storage databases and data modeling techniques, data processing and querying, data analytics and applications of machine learning using these systems. SPRING. [3]

**CS 5269. Project in Artificial Intelligence.** (Also listed as CS 4269) Students work in small groups on the specification, design, implementation, and testing of a sizeable AI software project. Projects (e.g., an "intelligent" game player) require that students address a variety of AI subject areas, notably heuristic search, uncertain reasoning, planning, knowledge representation, and learning. Class discussion highlights student progress, elaborates topics under investigation, and identifies other relevant topics (e.g., vision) that the project does not explore in depth. No credit for students who have earned credit for 4269. SPRING. [3]

**CS 5270. Programming Languages.** (Also listed as CS 3270) General criteria for design, implementation, and evaluation of programming languages. Historical perspective. Syntactic and semantic specification, compilations, and interpretation processes. Comparative studies of data types and data control, procedures and parameters, sequence control, nesting, scope and storage management, run-time representations. Non-standard languages, problem-solving assignments in a laboratory environment. No credit for students who have earned credit for 3270. FALL. [3]

**CS 5274. Modeling and Simulation.** (Also listed as CS 3274) General theory of modeling and simulation of a variety of systems: physical processes, computer systems, biological systems, and manufacturing processes. Principles of discrete-event, continuous, and hybrid system modeling, simulation algorithms for the different modeling paradigms, methodologies for constructing models of a number of realistic systems, and analysis of system behavior. Computational issues in modeling and analysis of systems. Stochastic simulations. No credit for students who have earned credit for 3274. [3]

**CS 5276. Compiler Construction.** (Also listed as CS 3276) Review of programming language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions and statements. Organization of a compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design. Use of a high-level language to write a complete compiler. No credit for students who have earned credit for 3276. [3]

**CS 5278. Principles of Software Engineering.** (Also listed as CS 4278) The nature of software. The object-oriented paradigm. Software life-cycle models. Requirements, specification, design, implementation, documentation, and testing of software. Object-oriented analysis and design. Software maintenance. No credit for students who have earned credit for 4278. FALL. [3]

**CS 5279. Software Engineering Project.** (Also listed as CS 4279) Students work in teams to specify, design, implement, document, and test a nontrivial software project. The use of CASE (Computer Assisted Software Engineering) tools is stressed. No credit for students who have earned credit for 4279. SPRING. [3]

**CS 5281. Principles of Operating Systems I.** (Also listed as CS 3281) Resource allocation and control functions of operating systems. Scheduling of processes and processors. Concurrent processes and primitives for their synchronization. Use of parallel processes in designing operating system subsystems. Methods of implementing parallel processes on conventional computers. Virtual memory, paging, protection of shared and non-shared information. Structures of data files in secondary storage. Security issues. Case studies. No credit for students who have earned credit for 3281. FALL, SPRING. [3]

**CS 5282. Principles of Operating Systems II.** (Also listed as CS 3282)

Projects involving modification of a current operating system. Lectures on memory management policies, including virtual memory. Protection and sharing of information, including general models for implementation of various degrees of sharing. Resource allocation in general, including deadlock detection and prevention strategies. Introduction to operating system performance measurement, for both efficiency and logical correctness. Two hours lecture and one hour laboratory. No credit for students who have earned credit for 3282. [3]

**CS 5283. Computer Networks.** (Also listed as CS 4283) Computer communications. Network (Internet) architecture. Algorithms and protocol design at each layer of the network stack. Cross-layer interactions and performance analysis. Network simulation tools. Lab and programming assignments. No credit for students who have earned credit for 4283. [3]

**CS 5284. Computer Systems Analysis.** (Also listed as CS 4284) Techniques for evaluating computer system performance with emphasis upon application. Topics include measurement and instrumentation techniques, benchmarking, simulation techniques, elementary queuing models, data analysis, operation analysis, performance criteria, case studies. Project involving a real computer system. No credit for students who have earned credit for 4284. [3]

**CS 5285. Network Security.** (Also listed as CS 4285) Principles and practice of network security. Security threats and mechanisms. Cryptography, key management, and message authentication. System security practices and recent research topics. No credit for students who have earned credit for 4285. [3]

**CS 5287. Principles of Cloud Computing.** Fundamental concepts of cloud computing, different service models, techniques for resource virtualization, programming models, management, mobile cloud computing, recent advances, and hands-on experimentation. [3]

**CS 5288. Web-based System Architecture.** Core concepts necessary to architect, build, test, and deploy complex web-based systems; analysis of key domain requirements in security, robustness, performance, and scalability. FALL. [3]

**CS 5891. Special Topics.** (Also listed as CS 3891) [Variable credit: 1-3 each semester] No credit for students who have earned credit for 3891. (Offered on demand)

**CS 5892. Special Topics.** (Also listed as CS 3892) [Variable credit: 1-3 each semester] No credit for students who have earned credit for 3892. (Offered on demand)

**CS 6310. Design and Analysis of Algorithms.** [Formerly CS 310] Set manipulation techniques, divide-and-conquer methods, the greedy method, dynamic programming, algorithms on graphs, backtracking, branch-and-bound, lower bound theory, NP-hard and NP-complete problems, approximation algorithms. Prerequisite: CS 3250. SPRING. [3]

**CS 6311. Graph Algorithms.** [Formerly CS 311] Algorithms for dealing with special classes of graphs. Particular emphasis is given to subclasses of perfect graphs and graphs that can be stored in a small amount of space. Interval, chordal, permutation, comparability, and circular-arc graphs; graph decomposition. Prerequisite: CS 6310 or MATH 4710. [3]

**CS 6315. Automated Verification.** [Formerly CS 315] Systems verification and validation, industrial case studies, propositional and predicate logic, syntax and semantics of computational tree and linear time logics, binary decision diagrams, timed automata model and real-time verification, hands on experience with model checking using the SMV, SPIN and UPPAAL tools, and state reduction techniques. [3]

**CS 6320. Algorithms for Parallel Computing.** [Formerly CS 320] Design and analysis of parallel algorithms for sorting, searching, matrix processing, FFT, optimization, and other problems. Existing and proposed parallel architectures, including SIMD machines, MIMD machines, and VLSI systolic arrays. Prerequisite: CS 6310. [3]

**CS 6350. Artificial Neural Networks.** [Formerly CS 350] Theory and practice of parallel distributed processing methods using networks

of neuron-like computational devices. Neurobiological inspirations, attractor networks, correlational and error-correction learning, regularization, unsupervised learning, reinforcement learning, Bayesian and information theoretic approaches, hardware support, and engineering applications. SPRING. [3]

**CS 6351. Advanced Animation.** [Formerly CS 351] Current research issues and problems in computer animation, with special focus on motion capture, dynamic simulation, and key-framing. Cloth, deformable bodies, natural phenomena, geometric algorithms, procedural techniques, facial animation, hair, autonomous characters, flocking, empirical evaluation, and interfaces for animation. Prerequisite: CS 3259. FALL. [3]

**CS 6352. Human-Computer Interaction.** [Formerly CS 352] An overview of human computer interaction and problems of current interest. Topics include: Human factors, GOMS, user interface design and evaluation, interaction modalities, distributed cognition, ubiquitous computing. A project involving design and evaluation will be performed. [3]

**CS 6358. Computer Vision.** [Formerly CS 358] The fundamentals of computer vision and techniques for image understanding and high-level image processing. Includes image segmentation, geometric structures, relational structures, motion, matching, inference, and vision systems. Prerequisite: EECE 6357. SPRING. [3]

**CS 6359. Medical Image Registration.** [Formerly CS 359] Foundations of medical image registration. Mathematical methods and practical applications. Image-to-image registration, image-to-physical registration, applications to image-guided procedures and the most commonly used imaging modalities with an emphasis on tomographic images. FALL. [3]

**CS 6360. Advanced Artificial Intelligence.** [Formerly CS 360] Discussion of state-of-the-art and current research issues in heuristic search, knowledge representation, deduction, and reasoning. Related application areas include: planning systems, qualitative reasoning, cognitive models of human memory, user modeling in ICAI, reasoning with uncertainty, knowledge-based system design, and language comprehension. Prerequisite: CS 4260 or equivalent. [3]

**CS 6362. Machine Learning.** [Formerly CS 362] An introduction to machine learning principles of artificial intelligence, stressing learning's role in constraining search by augmenting and/or reorganizing memory. Topics include connectionist systems; concept learning from examples; operator, episode, and plan learning; problem-solving architectures that support learning; conceptual clustering; computer models of scientific discovery; explanation-based learning; and analogical reasoning. Psychological as well as computational interests in learning are encouraged. Prerequisite: CS 4260, CS 6360, or equivalent. SPRING. [3]

**CS 6364. Intelligent Learning Environments.** [Formerly CS 364] Theories and concepts from computer science, artificial intelligence, cognitive science, and education that facilitate designing, building, and evaluating computer-based instructional systems. Development and substantiation of the concept, architecture, and implementation of intelligent learning environments. Multimedia and web-based technology in teaching, learning, collaboration, and assessment. Prerequisite: CS 4260, CS 6360, or equivalent. [3]

**CS 6366. Distributed Artificial Intelligence.** [Formerly CS 366] Principles and practice of multiple agent systems for distributed artificial intelligence. Game theory, distributed negotiation and decision making, distributed problem solving, cooperation, coalition formation and distributed learning. Prerequisite: CS 4260. [3]

**CS 6375. Discrete-Event Systems: Supervisory Control and Diagnosis.** [Formerly CS 375] Algebraic structures, automata and formal language theory, process modeling with finite-state automata, supervisory control theory, controllability and supervision, supervisory control under partial observation, modular and hierarchical supervisory control, supervisory control of real-time systems, fault diagnosis of discrete-event systems, and modular diagnosis approaches. SPRING. [3]

**CS 6376. Foundations of Hybrid and Embedded Systems.** [Formerly CS 376] Modeling, analysis, and design of hybrid and embedded systems.

Heterogeneous modeling and design of embedded systems using formal models of computation, modeling and simulation of hybrid systems, properties of hybrid systems, analysis methods based on abstractions, reachability, and verification of hybrid systems. FALL. [3]

**CS 6377. Topics in Embedded Software and Systems.** [Formerly CS 377] Specification and composition of domain-specific modeling languages. Design methodologies for embedded systems. Platforms for embedded system design and implementation. Analysis of embedded systems. SPRING. [3]

**CS 6381. Distributed Systems Principles.** [Formerly CS 381] Techniques and mechanisms in distributed system design, such as logical clocks, distributed consensus, distributed mutual exclusion, consistency models, fault tolerance and paradigms of communication. Contemporary distributed system case studies and open challenges. Prerequisite: CS 3281. [3]

**CS 6384. Performance Evaluation of Computer Systems.** [Formerly CS 384] Techniques for computer systems modeling and analysis. Topics covered include analytical modeling with emphasis on queuing network models, efficient computational algorithms for exact and approximate solutions, parameter estimation and prediction, validation techniques, workload characterization, performance optimization, communication and distributed system modeling. Prerequisite: CS 3281 or CS 6381. SPRING. [3]

**CS 6385. Advanced Software Engineering.** [Formerly CS 385] An intensive study of selected areas of software engineering. Topics may include CASE tools, formal methods, generative techniques, aspect-oriented programming, metrics, modeling, reuse, software architecture, testing, and open-source software. Prerequisite: CS 4278. FALL. [3]

**CS 6386. System-Level Fault Diagnosis.** [Formerly CS 386] An overview of the basic concepts of the theory of fault diagnosis and problems of current interest. Topics include the classical PMC and BGM models of fault diagnosis, hybrid (permanent and intermittent faults) models, diagnostic measures for one-step, sequential, and inexact diagnosis. Emphasis is on algorithmic techniques for solving the diagnosis and diagnosability problems in various models. Prerequisite: CS 6381. SPRING. [3]

**CS 6387. Topics in Software Engineering.** [Formerly CS 387] Topics may include empirical software engineering and open-source software engineering. Prerequisite: CS 4278 or consent of instructor. SPRING. [3]

**CS 6388. Model-Integrated Computing.** [Formerly CS 388] Model-Integrated Computing addresses the problems of designing, creating, and evolving information systems by providing rich, domain-specific modeling environments including model analysis and model-based program synthesis tools. Students are required to give a class presentation and prepare a project. FALL. [3]

**CS 7999. Master's Thesis Research.** [Formerly CS 369]

**CS 8390. Individual Studies.** [Formerly CS 390] Offered each term. [1-3]

**CS 8395. Special Topics.** [Formerly CS 395] [3]

**CS 8396. Special Topics.** [Formerly CS 396] [3]

**CS 8991. Seminar.** [Formerly CS 391] [1-3 each semester]

**CS 8992. Seminar.** [Formerly CS 392] [1-3 each semester]

**CS 8999. Non-Candidate Research.** [Formerly CS 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit 0-12]

**CS 9999. Ph.D. Dissertation Research.** [Formerly CS 399]

## Electrical Engineering

**EECE 2112. Circuits I.** [Formerly EECE 112] Development of basic electrical circuit element models, signal representations, and methods of circuit analysis. Matrix methods and computer techniques. Demonstrations of physical components, measurement techniques, and

transient phenomena. Corequisite: PHYS 1602; MATH 2300. FALL, SPRING. [3]

**EECE 2116. Digital Logic.** [Formerly EECE 116] Numbering systems. Boolean algebra and combinational logic, graphical simplification, sequential logic, registers, and state machines. Corequisite: EECE 2116L. FALL, SPRING. [3]

**EECE 2116L. Digital Logic Laboratory.** [Formerly EECE 116L] Laboratory for EECE 2116. One three-hour laboratory per week. Corequisite: EECE 2116. FALL, SPRING. [1]

**EECE 2213. Circuits II.** [Formerly EECE 213] Steady-state and transient analysis of electrical networks with emphasis on Laplace transform methods and pole-zero concepts. Prerequisite: EECE 2112, PHYS 1602. Corequisite: EECE 2213L, MATH 2400. FALL, SPRING. [3]

**EECE 2213L. Circuits II Laboratory.** [Formerly EECE 213L] Laboratory for EECE 2213. One three-hour laboratory per week. Corequisite: EECE 2213. FALL, SPRING. [1]

**EECE 2218. Microcontrollers.** [Formerly EECE 218] Microprocessor and microcontroller architecture with emphasis on control applications. Usage of assembly language and interfacing with programs written in high-level languages. Interfacing and real-time I/O with 8-bit microprocessors, control algorithms, and networking with microcontrollers. Graduate credit only for non-majors. Prerequisite: EECE 2116, CS 1101 or CS 1103. Corequisite: EECE 2218L. SPRING. [3]

**EECE 2218L. Microcontrollers Laboratory.** [Formerly EECE 218L] Laboratory for EECE 2218. A small structured project is required. One three-hour laboratory per week. Graduate credit only for non-majors. Corequisite: EECE 2218. SPRING. [1]

**EECE 3214. Signals and Systems.** [Formerly EECE 214] Fundamental signals, systems, and linear algebra concepts necessary for the study of communications and control systems. Includes continuous-time and discrete-time signal and system concepts, Fourier analysis in both continuous and discrete-time, Z-transform, and the FFT. Prerequisite: EECE 2112. FALL, SPRING. [3]

**EECE 3233. Electromagnetics.** [Formerly EECE 233] Introduction to electromagnetic field theory. Maxwell's equations are developed from the historical approach. Electromagnetic waves are discussed with regard to various media and boundary conditions. Graduate credit only for non-majors. Prerequisite: PHYS 1602. Corequisite: MATH 2400. FALL. [3]

**EECE 3235. Electronics I.** [Formerly EECE 235] Introduction to semiconductor devices and electronic circuits. Diodes, BJT and MOS transistors. Device models, modes of operation, biasing. Small-signal models, low-frequency analysis of single- and multi-stage analog amplifiers, simple amplifier design. Large signal models, dc analysis of digital circuits. Graduate credit only for non-majors. Prerequisite: EECE 2112. Corequisite: EECE 3235L. FALL. [3]

**EECE 3235L. Electronics I Laboratory.** [Formerly EECE 235L] Laboratory for EECE 3235. One three-hour laboratory per week. Corequisite: EECE 3235. FALL. [1]

**EECE 3850. Independent Study.** [Formerly EECE 203] Readings or projects on basic topics in electrical engineering or related fields under the supervision of the staff. Consent of instructor required. No more than 6 hours of EECE 3850 and 3851 may be applied toward graduation. [Variable credit: 1-3 each semester]

**EECE 3851. Independent Study.** [Formerly EECE 204] Readings or projects on basic topics in electrical engineering or related fields under the supervision of the staff. Consent of instructor required. No more than 6 hours of EECE 3850 and 3851 may be applied toward graduation. [Variable credit: 1-3 each semester]

**EECE 3891. Special Topics.** [Formerly EECE 291] [Variable credit: 1-3 each semester]

**EECE 3892. Special Topics.** [Formerly EECE 292] [Variable credit: 1-3 each semester]

**EECE 4252. Signal Processing and Communications.** [Formerly EECE 252] AM and FM modulation. Also, advanced topics in signal processing are treated. Prerequisite: EECE 3214. SPRING. [3]

**EECE 4257. Control Systems I.** [Formerly EECE 257] Introduction to the theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Model representation. State-variable models. Prerequisite: EECE 2213 or EECE 3214. FALL. [3]

**EECE 4267. Power System Analysis.** [Formerly EECE 267] Analysis of large transmission and distribution networks. Analysis of power lines, load flow, short circuit studies, economic operation, and stability are introduced. Prerequisite: EECE 2213. [3]

**EECE 4275. Microelectronic Systems.** [Formerly EECE 275] Active devices in the context of digital systems, with an emphasis on embedded systems integration. Characteristics and utilization of different digital integrated circuit families, common bus structures and protocols and real-world interfaces (comparators, A/D/A conversion). Prerequisite: EECE 2112, EECE 2116. SPRING. [3]

**EECE 4283. Principles and Models of Semiconductor Devices.** [Formerly EECE 283] Physical principles of operation of the p-n junction, MOS field-effect transistor, and bipolar transistor. Fundamentals of charge transport, charge storage, and generation-recombination; application to the operation of MOSFET and BJT. Device modeling with emphasis on features and constraints of integrated circuit technologies. Prerequisite: EECE 3235. [3]

**EECE 4284. Integrated Circuit Technology and Fabrication.** [Formerly EECE 284] Introduction to monolithic integrated circuit technology. Understanding of basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Elements of fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. Prerequisite: EECE 3235. SPRING. [3]

**EECE 4286. Audio Engineering.** [Formerly EECE 286] Engineering aspects of high fidelity sound reproduction, with emphasis on digital audio and loudspeakers. Analog-to-digital and digital-to-analog conversion, data storage, perceptual coding, loudspeaker design. Prerequisite: EECE 2213, EECE 3235. [3]

**EECE 4287. Engineering Reliability.** [Formerly EECE 287] Topics in engineering reliability with emphasis on electrical devices and systems. Reliability concepts and models. Risk analysis. Lifetime evaluation. System examples. Prerequisite: EECE 3235 or EECE 4275. [3]

**EECE 4288. Optoelectronics.** [Formerly EECE 288] Fundamentals and applications of light generation, propagation, and modulation in passive and active optoelectronic components. Waveguides, lasers, electro-optic modulators, and emerging optoelectronic technology for optical communication, computing, and sensing applications. Prerequisite: EECE 3233 or equivalent. SPRING. [3]

**EECE 4353. Image Processing.** [Formerly EECE 253] The theory of signals and systems is extended to two dimensions. Coverage includes filtering, 2-D FFTs, edge detection, and image enhancement. Three lectures and one laboratory period. FALL. [4]

**EECE 4354. Computer Vision.** [Formerly EECE 254] Vision is presented as a computational problem. Coverage includes theories of vision, inverse optics, image representation, and solutions to ill-posed problems. Prerequisite: EECE 4353. [3]

**EECE 4356. Digital Signal Processing.** [Formerly EECE 256] Applications of Digital Signal Processing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laboratory period. Prerequisite: EECE 3214. SPRING. [4]

**EECE 4358. Control Systems II.** [Formerly EECE 258] Modern control design. Discrete-time analysis. Analysis and design of digital control systems. Introduction to nonlinear systems and optimum control systems. Fuzzy control systems. Two lectures and one laboratory. Prerequisite: EECE 4257. SPRING. [3]

**EECE 4371. Mobile and Wireless Networks.** [Formerly EECE 261] Design, development, and applications of mobile applications and services. Topics include wireless technologies, smart phone programming, cloud computing services. Credit given for only one of EECE 4371 or CS 4283. Prerequisite: CS 2201 or equivalent programming experience. [3]

**EECE 4376. Embedded Systems.** [Formerly EECE 276] Advanced course on the design and application of embedded microcontroller-based systems. Architecture and capabilities of advanced microcontrollers. Embedded system modeling, design, and implementation using real-time and event-driven techniques. A structured project is required. Prerequisite: EECE 2218, CS 2201. Corequisite: EECE 4376L. FALL. [3]

**EECE 4376L. Embedded Systems Laboratory.** [Formerly EECE 276L] Laboratory for EECE 4376. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: EECE 4376. FALL. [1]

**EECE 4377. FPGA Design.** [Formerly EECE 277] Design and applications of field-programmable gate arrays, Electronic Design Automation (EDA) tools for design, placement, and routing. Hardware description languages. Implementation of designs on prototype FPGA board. Prerequisite: EECE 2116. [3]

**EECE 4380. Electronics II.** [Formerly EECE 280] Integrated circuit analysis and design. High frequency operation of semiconductor devices. Frequency-response and feedback analysis of BJT and MOS analog amplifier circuits, multi-stage frequency-compensated amplifier design. Transient analysis of BJT and MOS digital circuit families. Digital-to-analog and analog-to-digital conversion circuits. Prerequisite: EECE 3235. SPRING. [3]

**EECE 4385. VLSI Design.** [Formerly EECE 285] Integrated circuit and fabrication techniques; CAD tools for design, layout, and verification; parasitic elements and their effects on circuit performance; system-level design experience is gained by completing design and layout phases of a project. Prerequisite: EECE 2116, EECE 3235. FALL. [3]

**EECE 4950. Program and Project Management for EECE.** [Formerly EECE 295] Methods for planning programs and projects. Organization structures and information management for project teams. Communications between project teams and clients, government agencies, and others. Motivational factors and conflict resolution. Budget/schedule control. Similar to ENGM 3700, but preparatory to the EECE senior design project course, EECE 4951. Not for graduate credit. Credit given for only one of ENGM 3700, CE 4400 or EECE 4950. Prerequisite: Senior standing. Corequisite: EECE 4959. FALL. [3]

**EECE 4951. Electrical and Computer Engineering Design.** [Formerly EECE 296] Based on product specifications typically supplied by industrial sponsors, teams of students responsible for the formulation, execution, qualification, and documentation of a culminating engineering design. The application of knowledge acquired from earlier coursework, both within and outside the major area, along with realistic technical, managerial, and budgetary constraints using standard systems engineering methodologies and practices. Not for graduate credit. Prerequisite: EECE 4950, at least one DE course, senior standing. SPRING. [3]

**EECE 4959. Senior Engineering Design Seminar.** [Formerly EECE 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: EECE 4950. FALL. [1]

**EECE 5218. Microcontrollers.** (Also listed as EECE 2218) Microprocessor and microcontroller architecture with emphasis on control applications. Usage of assembly language and interfacing with programs written in high-level languages. Interfacing and realtime I/O with 8-bit microprocessors, control algorithms, and networking with microcontrollers. Graduate credit only for non-majors. No credit for students who have earned credit for 2218. Corequisite: EECE 5218L. SPRING. [3]

**EECE 5218L. Microcontrollers Laboratory.** (Also listed as EECE 2218L) Laboratory for EECE 5218. A small structured project is required. One three-hour laboratory per week. Graduate credit only for non-majors. No credit for students who have earned credit for 2218L. Corequisite: EECE 5218. SPRING. [1]

**EECE 5233. Electromagnetics.** (Also listed as EECE 3233) Introduction to electromagnetic field theory. Maxwell's equations are developed from the historical approach. Electromagnetic waves are discussed with regard to various media and boundary conditions. Graduate credit only for non-majors. No credit for students who have earned credit for 3233. FALL. [3]

**EECE 5235. Electronics I.** (Also listed as EECE 3235) Introduction to semiconductor devices and electronic circuits. Diodes, BJT and MOS transistors. Device models, modes of operation, biasing. Small-signal models, low-frequency analysis of single- and multi-stage analog amplifiers, simple amplifier design. Large signal models, dc analysis of digital circuits. Graduate credit only for non-majors. Corequisite: EECE 5235L. No credit for students who have earned credit for 3235. FALL. [3]

**EECE 5235L. Electronics I Laboratory.** (Also listed as EECE 3235L) Laboratory for EECE 3235. One three-hour laboratory per week. Corequisite: EECE 5235. No credit for students who have earned credit for 3235L. FALL. [1]

**EECE 5252. Signal Processing and Communications.** (Also listed as EECE 4252) AM and FM modulation. Also, advanced topics in signal processing are treated. No credit for students who have earned credit for 4252. SPRING. [3]

**EECE 5257. Control Systems I.** (Also listed as EECE 4257) Introduction to the theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Model representation. State-variable models. No credit for students who have earned credit for 4257. FALL. [3]

**EECE 5267. Power System Analysis.** (Also listed as EECE 4267) Analysis of large transmission and distribution networks. Analysis of power lines, load flow, short circuit studies, economic operation, and stability are introduced. No credit for students who have earned credit for 4267. [3]

**EECE 5275. Microelectronic Systems.** (Also listed as EECE 4275) Active devices in the context of digital systems, with an emphasis on embedded systems integration. Characteristics and utilization of different digital integrated circuit families, common bus structures and protocols and realworld interfaces (comparators, A/D/A conversion). No credit for students who have earned credit for 4275. SPRING. [3]

**EECE 5283. Principles and Models of Semiconductor Devices.** (Also listed as EECE 4283) Physical principles of operation of the p-n junction, MOS field-effect transistor, and bipolar transistor. Fundamentals of charge transport, charge storage, and generation-recombination; application to the operation of MOSFET and BJT. Device modeling with emphasis on features and constraints of integrated circuit technologies. No credit for students who have earned credit for 4283. [3]

**EECE 5284. Integrated Circuit Technology and Fabrication.** (Also listed as EECE 4284) Introduction to monolithic integrated circuit technology. Understanding of basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Elements of fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. No credit for students who have earned credit for 4284. SPRING. [3]

**EECE 5286. Audio Engineering.** (Also listed as EECE 4286) Engineering aspects of high fidelity sound reproduction, with emphasis on digital audio and loudspeakers. Analog-to-digital and digital-to-analog conversion, data storage, perceptual coding, loudspeaker design. No credit for students who have earned credit for 4286. [3]

**EECE 5287. Engineering Reliability.** (Also listed as EECE 4287) Topics in engineering reliability with emphasis on electrical devices and systems. Reliability concepts and models. Risk analysis. Lifetime evaluation. System examples. No credit for students who have earned credit for 4287. [3]

**EECE 5288. Optoelectronics.** (Also listed as EECE 4288) Fundamentals and applications of light generation, propagation, and modulation in passive and active optoelectronic components. Waveguides, lasers, electro-optic modulators, and emerging optoelectronic technology for optical communication, computing, and sensing applications. No credit for students who have earned credit for 4288. SPRING. [3]

**EECE 5353. Image Processing.** (Also listed as EECE 4353) The theory of signals and systems is extended to two dimensions. Coverage includes filtering, 2-D FFTs, edge detection, and image enhancement. Three lectures and one laboratory period. No credit for students who have earned credit for 4353. FALL. [4]

**EECE 5354. Computer Vision.** (Also listed as EECE 4354) Vision is presented as a computational problem. Coverage includes theories of vision, inverse optics, image representation, and solutions to ill-posed problems. No credit for students who have earned credit for 4354. [3]

**EECE 5356. Digital Signal Processing.** (Also listed as EECE 4356) Applications of Digital Signal Processing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laboratory period. No credit for students who have earned credit for 4356. SPRING. [4]

**EECE 5358. Control Systems II.** (Also listed as EECE 4358) Modern control design. Discrete-time analysis. Analysis and design of digital control systems. Introduction to nonlinear systems and optimum control systems. Fuzzy control systems. Two lectures and one laboratory. No credit for students who have earned credit for 4358. SPRING. [3]

**EECE 5371. Mobile and Wireless Networks.** (Also listed as EECE 4371) Design, development, and applications of mobile applications and services. Topics include wireless technologies, smart phone programming, cloud computing services. No credit for students who have earned credit for 4271. [3]

**EECE 5376. Embedded Systems.** (Also listed as EECE 4376) Advanced course on the design and application of embedded microcontroller-based systems. Architecture and capabilities of advanced microcontrollers. Embedded system modeling, design, and implementation using real-time and event-driven techniques. A structured project is required. No credit for students who have earned credit for 4376. Corequisite: EECE 5376L. FALL. [3]

**EECE 5376L. Embedded Systems Laboratory.** (Also listed as EECE 4376L) Laboratory for EECE 5376. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: EECE 5376. No credit for students who have earned credit for 4376L. FALL. [1]

**EECE 5377. FPGA Design.** (Also listed as EECE 4377) Design and applications of field-programmable gate arrays, Electronic Design Automation (EDA) tools for design, placement, and routing. Hardware description languages. Implementation of designs on prototype FPGA board. No credit for students who have earned credit for 4377. [3]

**EECE 5380. Electronics II.** (Also listed as EECE 4380) Integrated circuit analysis and design. High frequency operation of semiconductor devices. Frequency-response and feedback analysis of BJT and MOS analog amplifier circuits, multi-stage frequency-compensated amplifier design. Transient analysis of BJT and MOS digital circuit families. Digital-to-analog and analog-to-digital conversion circuits. No credit for students who have earned credit for 3380. SPRING. [3]

**EECE 5385. VLSI Design.** (Also listed as EECE 4385) Integrated circuit and fabrication techniques; CAD tools for design, layout, and verification; parasitic elements and their effects on circuit performance; system-level design experience is gained by completing design and layout phases of a project. No credit for students who have earned credit for 4385. FALL. [3]

**EECE 5891. Special Topics.** (Also listed as EECE 3891) No credit for students who have earned credit for 3891. [Variable credit: 1-3 each semester]

**EECE 5892. Special Topics.** (Also listed as EECE 3892) [Variable credit: 1-3 each semester] No credit for students who have earned credit for 3892.

**EECE 6301. Introduction to Solid-State Materials.** [Formerly EECE 301] The properties of charged particles under the influence of an electric field, quantum mechanics, particle statistics, fundamental particle transport, and band theory of solids will be studied. FALL. [3]

**EECE 6302. Electric and Magnetic Properties of Solids.** [Formerly EECE 302] A review of electromagnetic theory of solids using advanced mathematical and computational techniques. Dielectric, magnetic, and optical properties. Fundamental interactions of electromagnetic radiation and charged particles in solids. Prerequisite: EECE 6301. SPRING. [3]

**EECE 6304. Radiation Effects and Reliability of Microelectronics.** [Formerly EECE 304] The space radiation environment and effects on electronics, including basic mechanisms of radiation effects and testing issues. Total dose, single-event, high-dose-rate, and displacement damage radiation effects. Effects of defects and impurities on MOS long-term reliability. SPRING. [3]

**EECE 6305. Topics in Applied Magnetics.** [Formerly EECE 305] Selected topics in magnetism, magnetic properties of crystalline and non-crystalline materials; ferrite materials for electronics and microwave applications, resonance phenomena. Prerequisite: EECE 6302. [3]

**EECE 6306. Solid-State Effects and Devices I.** [Formerly EECE 306] The semiconductor equations are examined and utilized to explain basic principles of operation of various state-of-the-art semiconductor devices including bipolar and MOSFET devices. FALL. [3]

**EECE 6307. Solid-State Effects and Devices II.** [Formerly EECE 307] The structure of solids, phonons, band theory, scattering phenomena, and theory of insulators. [3]

**EECE 6311. Systems Theory.** [Formerly EECE 311] Analysis and design of multivariable control systems using state space methods. Stability, controllability, and observability treated. Controllers designed using pole placement, optimal linear regulator, and the method of decoupling. State reconstruction via observers. SPRING. [3]

**EECE 6321. Cyber-Physical Systems.** Modeling, design, and analysis of cyber-physical systems that integrate computation and communication with physical systems. Modeling paradigms and models of computation, design techniques and implementation choices, model-based analysis and verification. Project that covers the modeling, design, and analysis of CPS. [3]

**EECE 6341. Advanced Analog Electronics.** [Formerly EECE 341] Analysis and design of analog electronics circuits with emphasis on integrated circuits. Topics include operational amplifiers, wideband amplifiers, multipliers, and phaselocked loops. FALL. [3]

**EECE 6342. Advanced Digital Electronics.** [Formerly EECE 342] Analysis and design of digital electronic circuits with emphasis on integrated circuits. Topics include logic families, semiconductor memories, and the analog-digital interface. [3]

**EECE 6343. Digital Systems Architecture.** [Formerly EECE 343] Architectural descriptions of various CPU designs, storage systems, IO systems, parallel and von Neumann processors and interconnection networks will be studied. [3]

**EECE 6354. Advanced Real-Time Systems.** [Formerly EECE 354] Fundamental problems in real-time systems, with focus on modeling, analysis, and design. Topics include: scheduling theory and techniques, time synchronization, time- and event-triggered systems, distributed architectures, advanced programming languages for real-time systems. Literature reviews and projects. [3]

**EECE 6356. Intelligent Systems and Robotics.** [Formerly EECE 356] Concepts of intelligent systems, AI robotics, and machine intelligence, using research books and papers. Emphasis on how AI, brain research, soft computing, and simulations are advancing robotics. Class projects. [3]

**EECE 6357. Advanced Image Processing.** [Formerly EECE 357] Techniques of image processing. Topics include image formation, digitization, linear shift-invariant processing, feature detection, and motion. Prerequisite: MATH 2300; programming experience. FALL. [3]

**EECE 6358. Quantitative Medical Image Analysis.** Image processing and statistical methods for quantitative analysis and interpretation of medical imaging data. Neuroimaging approaches related to brain structure, function, and connectivity. Massively univariate analysis (parametric mapping), multiple comparison issues, random fields, independent components, non-parametric approaches, and Monte Carlo methods. Students should have knowledge of undergraduate probability and computer programming. [3]

**EECE 6361. Random Processes.** [Formerly EECE 361] An introduction to the concepts of random variables, functions of random variables and random processes. Study of the spectral properties of random processes and of the response of linear systems to random inputs. Introduction to linear mean square estimation. The emphasis is on engineering applications. FALL. [3]

**EECE 6362. Detection and Estimation Theory.** [Formerly EECE 362] Fundamental aspects of signal detection and estimation. Formulation of maximum likelihood, maximum a posteriori, and other criteria. Multi-dimensional probability theory, signal and noise problems, and Kalman filter structure are studied. SPRING. [3]

**EECE 7899. Master of Engineering Project.** [Formerly EECE 389]

**EECE 7999. Master's Thesis Research.** [Formerly EECE 369]

**EECE 8395. Special Topics.** [Formerly EECE 395] Based on research and current developments in electrical engineering of special interest to staff and students. [3]

**EECE 8396. Special Topics.** [Formerly EECE 396] Based on research and current developments in electrical engineering of special interest to staff and students. [3]

**EECE 8850. Independent Study.** [Formerly EECE 397] Readings and/or projects on advanced topics in electrical engineering under the supervision of the staff. Consent of instructor required. [Variable credit: 1-3 each semester]

**EECE 8991. Seminar.** [Formerly EECE 392] [1]

**EECE 8992. Advanced Seminar for Ph.D. Candidates.** [Formerly EECE 393] [1]

**EECE 8999. Non-Candidate Research.** [Formerly EECE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit 0-12]

**EECE 9999. Ph.D. Dissertation Research.** [Formerly EECE 399]

## Engineering Management

**ENGM 2160. Engineering Economy.** [Formerly ENGM 216] Economic evaluation and comparison of alternatives: interest, periodic payments, depreciation, criteria, and analytical procedures in investment decision-making, and cost-estimating. FALL, SPRING. [3]

**ENGM 2210. Technology Strategy.** [Formerly ENGM 221] Critical issues faced by chief technology officers. Assessment of technological capabilities and opportunities, formulation of a technical plan for the product portfolio and commercialization, management of intellectual property, and economic analysis. Prerequisite: Sophomore standing. FALL, SPRING. [3]

**ENGM 2440. Applied Behavioral Science.** [Formerly ENGM 244] Leadership styles, power team building, conflict resolution, management resolution, interviewing techniques. Prerequisite: sophomore standing. FALL, SPRING, SUMMER. [3]

**ENGM 3000. Enterprise System Design.** [Formerly ENGM 272] Design of complex enterprise systems and processes including enterprise requirements analysis, process-mapping, modeling, performance measurement, benchmarking, solution development, and change management. Prerequisite: ENGM 2210, junior standing. FALL, SPRING. [3]

**ENGM 3010. Systems Engineering.** [Formerly ENGM 273] Fundamental considerations associated with the engineering of large-scale systems. Models and methods for systems engineering and problem

solving using a systems engineering approach. Prerequisite: ENGM 2210, junior standing. FALL, SPRING. [3]

**ENGM 3100. Finance and Accounting for Engineers.** [Formerly ENGM 251] Time value of money, capital budgeting and formation, financial accounting and reporting, double entry bookkeeping, taxation, performance ratio measurements, and working capital management. Probabilistic models for expected net present value and rate of return, dividend pricing models for alternative growth scenarios, cost and market based models for average cost of capital, taxation algorithms, and regression analysis for individual firm betas. Prerequisite: Junior standing. FALL, SPRING, SUMMER. [3]

**ENGM 3200. Technology Marketing.** [Formerly ENGM 242] Strategies for marketing technology-based products and services. Demand analysis, segmentation, distribution, and personal selling. Economic analysis from inception to end use. Prerequisite: ENGM 2210, junior standing. FALL. [3]

**ENGM 3300. Technology Assessment and Forecasting.** [Formerly ENGM 275] Methods of forecasting technological advancements and assessing their potential intended and unintended consequences. Delphi method, trend exploration, environmental monitoring, and scenario development. Prerequisite: Junior standing. SPRING. [3]

**ENGM 3350. Organizational Behavior.** [Formerly ENGM 264] Study of the factors that impact how individuals and groups interact and behave within organizations, and how organizations respond to their environment. Motivation theory, communication within organizations, group dynamics, conflict management, decision making, power, strategic planning, organizational culture, and change. Focus on utilizing analytical tools to understand organizations: symbolic, political, human resources, and structural. Prerequisite: ENGM 2440. [3]

**ENGM 3600. Technology-Based Entrepreneurship.** [Formerly ENGM 253] Identification and evaluation of opportunities: risks faced by entrepreneurs, market assessment, capital requirements, venture capital acquisition, legal structures, tax implications for sharing technology-based businesses. Prerequisite: Junior standing. FALL. [3]

**ENGM 3650. Operations and Supply Chain Management.** [Formerly ENGM 254] Manufacturing strategy, process analysis, product and process design, total quality management, capacity planning, inventory control, supply chain design, and advanced operations topics. Modeling and analysis using cases and spreadsheets. Prerequisite: Junior standing. FALL. [3]

**ENGM 3700. Program and Project Management.** [Formerly ENGM 274] Scheduling, cost estimation/predictions, network analysis, optimization, resource/load leveling, risk/mitigation, quality/testing, international projects. Term project required. Provides validated preparation for the Project Management Institute CAPM certification for undergraduates or the PMP for graduate students. Credit given for only one of ENGM 3700, CE 4400 or EECE 4950. Prerequisite: Junior standing. FALL, SPRING, SUMMER. [3]

**ENGM 3850. Independent Study.** [Formerly ENGM 289] Readings or projects on topics in engineering management under the supervision of the ENGM faculty. Consent of instructor required. FALL, SPRING. [1-3 each semester, not to exceed a total of 3].

**ENGM 3851. Independent Study.** [Formerly ENGM 290] Readings or projects on topics in engineering management under the supervision of the ENGM faculty. Consent of instructor required. FALL, SPRING. [1-3 each semester, not to exceed a total of 3]

**ENGM 3890. Special Topics.** [Formerly ENGM 291] [Variable credit 1-3 each semester]

**ENGM 3891. Special Topics.** [Formerly ENGM 292] [Variable credit: 1-3 each semester]

**ENGM 4500. Product Development.** [Formerly ENGM 276] Project-based course focused on the methods for managing the design, development, and commercialization of new products. Generating product concepts, developing a prototype strategy, modeling financial returns, securing intellectual property, designing retail packaging, and performing

market testing to establish an optimal price. Teams include Engineering and MBA students. Prerequisite: ENGM 2210; ENGM 3700 or CE 4400 or EECE 4950; junior or senior standing. SPRING. [4]

**ENGM 4800. Wealth Management for Engineers.** Foundations of financial planning; managing basic assets, credit, and insurance needs; employee incentive plans such as stock options, deferred compensation and severance; managing investments in stocks, bonds, mutual funds, and real estate; retirement and estate planning such as 401k, 403b, IRA, Roth, estate preservation. SPRING [1]

**ENGM 4951. Engineering Management Capstone Project.** [Formerly ENGM 296] Application of engineering management concepts through team projects sponsored by faculty or seed-stage technology companies. Thinking, analysis, and planning processes needed to commercialize a concept and develop a business plan for presentation to investors. Prerequisite: ENGM 2210; ENGM 3000 or 3010. Corequisite: ENGM 3700. SPRING. [3]

**ENGM 5000. Enterprise System Design.** (Also listed as ENGM 3000) Design of complex enterprise systems and processes including enterprise requirements analysis, process-mapping, modeling, performance measurement, benchmarking, solution development, and change management. No credit for students who have earned credit for 3000. FALL, SPRING. [3]

**ENGM 5010. Systems Engineering.** (Also listed as ENGM 3010) Fundamental considerations associated with the engineering of large-scale systems. Models and methods for systems engineering and problem solving using a systems engineering approach. No credit for students who have earned credit for 3010. FALL, SPRING. [3]

**ENGM 5100. Finance and Accounting for Engineers.** (Also listed as ENGM 3100) Time value of money, capital budgeting and formation, financial accounting and reporting, double entry bookkeeping, taxation, performance ratio measurements, and working capital management. Probabilistic models for expected net present value and rate of return, dividend pricing models for alternative growth scenarios, cost and market based models for average cost of capital, taxation algorithms, and regression analysis for individual firm betas. No credit for students who have earned credit for 3100. FALL, SPRING, SUMMER. [3]

**ENGM 5200. Technology Marketing.** (Also listed as ENGM 3200) Strategies for marketing technology-based products and services. Demand analysis, segmentation, distribution, and personal selling. Economic analysis from inception to end use. No credit for students who have earned credit for 3200. FALL. [3]

**ENGM 5300. Technology Assessment and Forecasting.** (Also listed as ENGM 3300) Methods of forecasting technological advancements and assessing their potential intended and unintended consequences. Delphi method, trend exploration, environmental monitoring, and scenario development. No credit for students who have earned credit for 3300. SPRING. [3]

**ENGM 5600. Technology-Based Entrepreneurship.** (Also listed as ENGM 3600) Identification and evaluation of opportunities: risks faced by entrepreneurs, market assessment, capital requirements, venture capital acquisition, legal structures, tax implications for sharing technology-based businesses. No credit for students who have earned credit for 3600. FALL. [3]

**ENGM 5650. Operations and Supply Chain Management.** (Also listed as ENGM 3650) Manufacturing strategy, process analysis, product and process design, total quality management, capacity planning, inventory control, supply chain design, and advanced operations topics. Modeling and analysis using cases and spreadsheets. No credit for students who have earned credit for 3650. FALL. [3]

**ENGM 5700. Program and Project Management.** (Also listed as ENGM 3700) Scheduling, cost estimation/predictions, network analysis, optimization, resource/load leveling, risk/mitigation, quality/testing, international projects. Term project required. Provides validated preparation for the Project Management Institute CAPM certification for undergraduates or the PMP for graduate students. Credit given for



only one of ENGM 3700 or 5700, CE 4400 or 5400, or EECE 4950. FALL, SPRING, SUMMER. [3]

## Engineering Science

**ES 0703. Preparatory Academics.** [Formerly ES 103] To prepare students to enter an undergraduate engineering or science program. The content will vary from year to year and is usually offered in combination with other academic courses, English as a second language, and various PAVE programs. No credit toward a Vanderbilt degree. Prerequisite: Consent of instructor. SUMMER. [0]

**ES 1001. Engineering Commons Seminar.** Topics vary. Open elective credit only.

**ES 1115. Engineering Freshman Seminar.** [Formerly ES 101] [1]

**ES 1401. Introduction to Engineering, Module 1.** [Formerly ES 140A] First of three required discipline-specific modules for Introduction to Engineering credit providing an introduction to engineering analysis and design. Discipline-specific modules selected based on individual choice. Students choose three different disciplines for the three modules and all three must be completed in one semester for full course credit. Emphasis is on contemporary engineering problem solving in a discipline-specific context. FALL. [1]

**ES 1402. Introduction to Engineering, Module 2.** [Formerly ES 140B] Continuation of ES 1401. ES 1401-1403 must be completed in one semester for full course credit. FALL. [1]

**ES 1403. Introduction to Engineering, Module 3.** [Formerly ES 140C] Continuation of ES 1402. ES 1401-1403 must be completed in one semester for full course credit. FALL. [1]

**ES 2100W. Technical Communications.** [Formerly ES 210W] Instruction and practice in written and oral communication. Emphasis is on organization and presentation of information to a specific audience for a specific purpose. Course will include writing and editing reports of various lengths, preparing and using visual aids, and presenting oral reports. Required of all EE, CMPE, and ES students. FALL, SPRING. [3]

**ES 2700. Engineering Career Development.** A practical course designed to help students succeed in the job/internship search and career development. Interviewing, networking, online tools, elevator pitch, career fair strategies, career center resources, company research techniques, resumes, cover letters, negotiating, follow-up messages. FALL [1]

**ES 2900. Engineering and Public Policy.** Role of federal policy in supporting and promoting engineering and science for the benefit of the U.S. Ways engineering, science and public policy impact each other. Federal government involvement, policy making, federal budget, role of universities and national labs, national defense, homeland security, biomedical enterprise. SPRING [3]

**ES 3230. Ships Engineering Systems.** [Formerly ES 230] Ship characteristics and types, including design and control, propulsion, hydrodynamic forces, stability, compartmentation, and electrical and auxiliary systems. Theory and design of steam, gas turbine, and nuclear propulsion. FALL. [3]

**ES 3231. Navigation.** [Formerly ES 231] Naval piloting procedures. Charts, visual and electronic aids, and theory and operation of magnetic and gyro compasses; inland and international rules of the nautical road. The celestial coordinate system, including spherical trigonometry and application for navigation at sea. Environmental influences on naval operations. SPRING. [3]

**ES 3232. Ships Weapons Systems.** [Formerly ES 232] Theory and employment of weapons systems, including the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. Fire control systems and major weapons types, including capabilities and limitations. Physical aspects of radar and underwater sound. Command, control, and communications and means of weapons system integration. SPRING. [3]

**ES 3233. Naval Operations.** [Formerly ES 233] Methods of tracking and intercepting at sea. Maritime maneuvering problems, formation tactics, and shipboard operations. Naval communications, ship behavior and maneuvering, and applied aspects of ship handling. Prerequisite: ES 3231. FALL. [3]

**ES 3300. Energy and Sustainability - An Engineering Approach.** Uses basic understanding of mechanics, thermodynamics, and electrostatics to describe primary and secondary energy generation and use. Emphasis on current applications, energy efficiency at both the source and demand sides, and future (near and long-term) energy scenarios. Various economic models are explored. Prerequisite: Junior standing. [3]

**ES 3860. Undergraduate Research.** [Formerly ES 248] Independent study under the direction of a faculty member with expertise in the area of study. FALL, SPRING. [1-3 each semester, not to exceed a total of 3]

**ES 3890. Special Topics.** [Formerly ES 290] Technical elective courses of special current interest. No more than six semester hours of these courses may be credited to the student's record. Prerequisite: consent of instructor. FALL, SPRING. [1-3]

## Overseas Study Programs

**FNTE 0800. France—GA Tech Lorraine.** [Formerly FNTE 250]

**FNTE 0801. Germany—Dresden.** [Formerly FNTE 252]

**FNTE 0802. Mexico—Guadalajara.** [Formerly FNTE 254]

**FNTE 0803. China—Hong Kong CUHK.** [Formerly FNTE 256]

**FNTE 0804. Singapore—Natl. U. Singapore.** [Formerly FNTE 258]

**FNTE 0805. Hungary—Budapest BUTE.** [Formerly FNTE 260]

**FNTE 2056. Italy—Turin Pol diTorino.** [Formerly FNTE 262]

**FNTE 2057. China—Hong Kong HKUST.** [Formerly FNTE 264]

**FNTE 2058. Spain—Madrid Engineering (IES).** [Formerly FNTE 266]

**FNTE 2059. Israel—Tel Aviv Engineering (BU).** [Formerly FNTE 268]

**FNTE 2099. Graduate Study.** [Formerly FNTE 299] Place marker course for dual degree students.

## Materials Science and Engineering

**MSE 1500. Materials Science I.** [Formerly MSE 150] Concepts of materials science developed from an understanding of the atomic and molecular structure of materials and their relationship to the properties of matter. Mechanical, electrical, physical, chemical, and magnetic properties of metals, ceramics, organics, composites, and semiconductors are covered. Corequisite: MSE 1500L. SPRING. [3]

**MSE 1500L. Materials Science Laboratory.** [Formerly MSE 150L] Laboratory for MSE 1500. One three-hour laboratory per week. Corequisite: MSE 1500. SPRING. [1]

**MSE 2205. Strength and Structure of Engineering Materials.** [Formerly MSE 232] A laboratory supplement to Mechanics of Materials, CE 2205. Students conduct experiments on the strength behavior of materials and simple engineering structures. Includes: tension and bending, fasteners, photoelastic analysis of stress concentrators, strain gage instrumentation to determine principal stresses, bending and deflection curves for simple beams, loaded columns, and short struts. Corequisite: CE 2205. FALL. [1]

**MSE 2500. Materials Science II.** [Formerly MSE 250] A study of engineering materials that includes microstructure and property characterization, materials selection, failure analysis, modern processing methods, and an introduction to nanostructured materials. Case studies and challenge based learning will be used to develop structure-processing concepts for the practice of materials science and engineering. Prerequisite: MSE 1500. FALL. [3]

**MSE 3850. Materials Science and Engineering Seminar.** [Formerly MSE 209B] Involving individual experimental, analytical, or design projects. A written final report is required. FALL. [Variable credit 1-3]

**MSE 3851. Materials Science and Engineering Undergraduate Research.** [Formerly MSE 209C] Open to selected senior engineering students wanting to do independent research. A formal written report is required. SPRING. [3]

**MSE 3889. Special Topics.** [Formerly MSE 210A] Technical elective courses of special current interest. No more than two semesters of this course may be credited to the student's record. [Variable credit: 1-3 each semester]

**MSE 3890. Special Topics.** [Formerly MSE 210B] Technical elective courses of special current interest. No more than two semesters of this course may be credited to the student's record. Prerequisite: consent of instructor. [Variable credit: 1-3 each semester] (Offered on demand)

**MSE 6310. Atomic Arrangements in Solids.** [Formerly MSE 310] A basic understanding of the atomic arrangements observed in metals, ceramics, semiconductors, glasses, and polymers. Lattice geometry and crystal symmetry are discussed in detail and these concepts are used to describe important crystal structures. Nanocrystalline materials are also covered. An introduction to scattering theory and diffraction phenomena provides insight into the analytical methods used by materials scientists for structural characterization. FALL. [3]

**MSE 6343. Introduction to Electron Microscopy.** [Formerly MSE 343] Principles and applications of transmission electron microscopy in the study of materials. Electron scattering, image contrast theory, operation of electron microscope, and specimen preparation. Use of the electron microscope in experimental investigations. Two lectures and one laboratory period. FALL. [3]

**MSE 6391. Special Topics.** [Formerly MSE 391] Based on faculty research projects and highly specialized areas of concentration. FALL, SPRING. [Variable credit: 1-3 each semester]

**MSE 6392. Special Topics.** [Formerly MSE 392] Based on faculty research projects and highly specialized areas of concentration. FALL, SPRING. [Variable credit: 1-3 each semester]

**MSE 7999. Master's Thesis Research.** [Formerly MSE 369]

**MSE 8991. Seminar.** [Formerly MSE 397] A required noncredit course for all graduate students in the program. Topics of special interest consolidating the teachings of previous courses by considering topics which do not fit simply into a single course category. FALL, SPRING. [0] Staff.

**MSE 8992. Seminar.** [Formerly MSE 398] A required noncredit course for all graduate students in the program. Topics of special interest consolidating the teachings of previous courses by considering topics which do not fit simply into a single course category. FALL, SPRING. [0] Staff.

**MSE 8999. Non-Candidate Research.** [Formerly MSE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

**MSE 9999. Ph.D. Dissertation Research.** [Formerly MSE 399]

## Mechanical Engineering

**ME 1150. Automotive Components Seminar.** [Formerly ME 150] General automotive knowledge for engineering and design considerations. Basic component function, terminology and design. Suspension (including suspension kinematics), steering (including steering geometry), driveline, transmission, engine and braking. Discussion and in-class participation. [1]

**ME 1151. Laboratory in Machining.** [Formerly ME 151] Introduction to machining and fabrication of metals and plastics. Fabrication, design and manufacturability of parts or components. [1]

**ME 1152. Laboratory in Welding.** [Formerly ME 152] Introduction to theory of welding processes and welding of metals. Design, fabrication, and manufacturability of parts or components using welding processes. [1]

**ME 1153. Computer Aided Design.** [Formerly ME 153] Introduction to the use of computers for solid modeling of machine parts and assemblies. [1]

**ME 2160. Introduction to Mechanical Engineering Design.** [Formerly ME 160] Design fundamentals, computer-aided design, machine fabrication techniques, technical drawing, team-based learning, and a comprehensive design project. Two lectures and one lab. Prerequisite: ES 1401-1403 and Mechanical Engineering major. FALL. [3]

**ME 2171. Instrumentation Laboratory.** [Formerly ME 171] Techniques associated with engineering measurements, curve fitting, presentation, and analysis of data. Corequisite: MATH 2300. SPRING. [2]

**ME 2190. Dynamics.** [Formerly ME 190] The principles of dynamics (kinematics and kinetics) of particles and rigid bodies. Mechanical vibrations. Introduction to continuous media. Prerequisite: CE 2200, PHYS 1601. Corequisite: MATH 2300. FALL, SPRING, SUMMER. [3]

**ME 2220. Thermodynamics.** [Formerly ME 220] Application of the first and second laws to energy transformation processes and properties of technologically important materials. Prerequisite: PHYS 1601, MATH 2300. FALL, SPRING, SUMMER. [3]

**ME 3202. Machine Analysis and Design.** [Formerly ME 202] Application of the principles of mechanics of materials to the analysis and synthesis of machine elements. Corequisite: CE 2205. FALL. [3]

**ME 3204. Mechatronics.** [Formerly ME 204] Design of analog and digital electromechanical sensors and actuators, signal and power electronics, and application of digital microcontrollers to mechatronic systems. Prerequisite: EECE 2112; CS 1101 or 1103. SPRING. [3]

**ME 3224. Fluid Mechanics.** [Formerly ME 224] Physical properties of fluids, surface tension, viscosity; fluid statics and dynamics; control volume analysis of mass, momentum, and energy; dimensional analysis, similitude, and modeling; viscous flows in pipes; drag and lift on immersed bodies. Prerequisite: ME 2190, MATH 2420. Credit not awarded for both ME 3224 and CE 3700. FALL. [3]

**ME 3234. Systems Dynamics.** [Formerly ME 234] Energy-based modeling of dynamic mechanical, electrical, thermal, and fluid systems to formulate linear state equations, including system stability, time domain response, and frequency domain techniques. Three lectures and one three-hour laboratory. Prerequisite: ME 2190, MATH 2420. FALL. [4]

**ME 3248. Heat Transfer.** [Formerly ME 248] Steady-state and transient heat transfer by conduction, forced and free convection and radiation, including heat transfer by boiling and condensing vapors. Application is made to practical design problems. Prerequisite: ME 2220, ME 3224. SPRING. [3]

**ME 3841. Mechanical Engineering Project.** [Formerly ME 209A] Under the direction of a faculty member, students conduct a research or design project culminating in an engineering report of the activities and findings. FALL, SPRING. [1]

**ME 3842. Mechanical Engineering Project.** [Formerly ME 209B] Under the direction of a faculty member, students conduct a research or design project culminating in an engineering report of the activities and findings. FALL, SPRING. [2]

**ME 3860. Mechanical Engineering Undergraduate Research.** [Formerly ME 209C] Under the direction of a faculty member, students conduct a research project. A formal, written report is required. FALL, SPRING. [3]

**ME 3890. Special Topics.** [Formerly ME 210] Technical elective courses of special current interest. No more than six semester hours of this course may be credited to the student's record. FALL, SPRING, SUMMER. [Variable credit: 1-3 each semester] (Offered on demand)

**ME 4213. Energetics Laboratory.** [Formerly ME 213] Experimental methods in heat transfer, fluid mechanics, and thermodynamics as applied to energy conversion systems and their analyses. Prerequisite: Senior standing. FALL. [2]

**ME 4221. Intermediate Thermodynamics.** [Formerly ME 221] Application of principles of thermodynamics to vapor and gas cycles, mixtures, combustion, and compressible flow. Prerequisite: ME 2220. Corequisite: MATH 2420. [3]

**ME 4226. Introduction to Gas Dynamics.** [Formerly ME 226] An introduction to the study of compressible flow from subsonic to supersonic flow regimes. Includes shock waves, expansion waves, shock tubes, and supersonic airfoils. Prerequisite: ME 3224. [3]

**ME 4236. Linear Control Theory.** [Formerly ME 236] Classical and modern approaches to the analysis and design of single-input/single-output (SISO) and multiple-input/multiple-output (MIMO) linear time invariant control systems. Classical (frequency-domain) and modern (state-space) approaches to SISO and MIMO control, including optimal control methods. Credit is given for only one of ME 4236 or ME 5236. Prerequisite: ME 3234. FALL. [3]

**ME 4251. Modern Manufacturing Processes.** [Formerly ME 251] Introduction to manufacturing science and processes. A quantitative approach dealing with metals, ceramics, polymers, composites, and nanofabrication and microfabrication technologies. Prerequisite: ME 3202. Corequisite: ME 4950. [3]

**ME 4258. Engineering Acoustics.** [Formerly ME 258] The wave equation and its solutions; acoustic sources; reflection and transmission of sound; propagation in pipes, cavities, and waveguides; noise standards and effects of noise on people; principles of noise and vibration control; signal processing in acoustics; environmental noise measurement and control; and various contemporary examples. Prerequisite: MATH 2400 or 2420. [3]

**ME 4259. Engineering Vibrations.** [Formerly ME 259] Theory of vibrating systems and application to problems related to mechanical design. Topics include single degree of freedom systems subject to free, forced, and transient vibrations; systems with several degrees of freedom, methods of vibration suppression and isolation, and critical speed phenomena. Prerequisite: ME 2190, MATH 2420. [3]

**ME 4260. Energy Conversion.** [Formerly ME 260] Energy resources, use, and conservation are studied. The fundamentals of positive displacement machinery, turbo-machinery, and reactive mixture are introduced and used to examine various forms of power-producing systems. Prerequisite: ME 2220, ME 3224. [3]

**ME 4261. Basic Airplane Aerodynamics.** [Formerly ME 261] Study of the atmosphere; analysis of incompressible and compressible flows, shock waves, boundary layer and skin friction drag, lift and drag forces over airfoils and wings, and flight performance; aircraft stability and control, wing icing, and parachute-based recovery; history of flight and aerodynamics. Corequisite: ME 3224. [3]

**ME 4262. Environmental Control.** [Formerly ME 262] A study of heating and cooling systems, energy conservation techniques, use of solar energy and heat pumps. Prerequisite: ME 2220. Corequisite: ME 3248. [3]

**ME 4263. Computational Fluid Dynamics and Multiphysics Modeling.** [Formerly ME 263] Computational modeling of viscous fluid flows and thermal-fluid-structure interaction. Computational techniques including finite-difference, finite-volume, and finite-element methods; accuracy, convergence, and stability of numerical methods; turbulence modeling; rotating machinery; multiphase flows; and multiphysics modeling. Prerequisite: ME 3224. SPRING. [3]

**ME 4264. Internal Combustion Engines.** [Formerly ME 264] A study of the thermodynamics of spark ignition and compression ignition engines; gas turbines and jet propulsion. Prerequisite: ME 2220. [3]

**ME 4265. Direct Energy Conversion.** [Formerly ME 265] The principles and devices involved in converting other forms of energy to electrical energy. Conversion devices: electro-mechanical, thermoelectric, thermionic, fluid dynamic, and fuel cell. Prerequisite: ME 2220. [3]

**ME 4267. Aerospace Propulsion.** [Formerly ME 267] Application of classical mechanics and thermodynamics to rocket and aircraft propulsion. Design and performance analysis of air-breathing and chemical rocket engines. Advanced propulsion systems for interplanetary travel. Contemporary issues in aerospace propulsion: space exploration, renewable fuels. Prerequisite: ME 2220, ME 3224. [3]

**ME 4271. Introduction to Robotics.** [Formerly ME 271] History and application of robots. Robot configurations including mobile robots.

Spatial descriptions and transformations of objects in three-dimensional space. Forward and inverse manipulator kinematics. Task and trajectory planning, simulation and off-line programming. Prerequisite: MATH 2410. [3]

**ME 4275. Introduction to Finite Element Analysis.** [Formerly ME 275] Development and solution of finite element equations for solid mechanics and heat transfer problems. Introduction to commercial finite element and pre- and post-processing software. Two lectures and one three-hour laboratory each week. Prerequisite: CE 2205, MATH 2420. [3]

**ME 4280. Advanced Dynamics of Mechanical Systems.** [Formerly ME 280] Development of methods for formulating differential equations to model mechanical systems, including formalisms of Newton-Euler, Lagrange, and virtual work methods to two- and three-dimensional systems. Prerequisite: ME 2190, MATH 2420. [3]

**ME 4284. Modeling and Simulation of Dynamic Systems.** [Formerly ME 284] Incorporates bond graph techniques for energy-based lumped-parameter systems. Includes modeling of electrical, mechanical, hydraulic, magnetic and thermal energy domains. Emphasis on multi-domain interaction. Prerequisite: ME 3234. [3]

**ME 4950. Design Synthesis.** [Formerly ME 242] Development of the design process: problem definition, design specifications, solution identification, idea synthesis, modeling and simulation, and design completion. Critical elements include problem selection, idea synthesis, and proposal writing. Individual design synthesis study projects required. Prerequisite: ME 3202. FALL. [2]

**ME 4951. Engineering Design Projects.** [Formerly ME 243] Each student participates in a major group design project. Lectures will cover case studies and topics of current interest in design. Prerequisite: ME 4950. SPRING. [3]

**ME 4959. Senior Engineering Design Seminar.** [Formerly ME 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: ME 4950. FALL. [1]

**ME 5236. Linear Control Theory.** [Formerly ME 336] (Also listed as ME 4236) Classical and modern approaches to the analysis and design of single-input/single-output (SISO) and multiple-input/multiple-output (MIMO) linear time invariant control systems. Classical (frequency-domain) and modern (state-space) approaches to SISO and MIMO control, including optimal control methods. Credit is given for only one of ME 4236 or ME 5236. [3]

**ME 5251. Modern Manufacturing Processes.** (Also listed as ME 4251) Introduction to manufacturing science and processes. A quantitative approach dealing with metals, ceramics, polymers, composites, and nanofabrication and microfabrication technologies. No credit for students who have earned credit for 4251. [3]

**ME 5258. Engineering Acoustics.** (Also listed as 4258) The wave equation and its solutions; acoustic sources; reflection and transmission of sound; propagation in pipes, cavities, and waveguides; noise standards and effects of noise on people; principles of noise and vibration control; signal processing in acoustics; environmental noise measurement and control; and various contemporary examples. [3]

**ME 5259. Engineering Vibrations.** (Also listed as ME 4259) Theory of vibrating systems and application to problems related to mechanical design. Topics include single degree of freedom systems subject to free, forced, and transient vibrations; systems with several degrees of freedom, methods of vibration suppression and isolation, and critical speed phenomena. No credit for students who have earned credit for 4259. [3]

**ME 5260. Energy Conversion.** (Also listed as ME 4260) Energy resources, use, and conservation are studied. The fundamentals of positive displacement machinery, turbo-machinery, and reactive mixture are introduced and used to examine various forms of power-producing systems. No credit for students who have earned credit for 4260. [3]

**ME 5261. Basic Airplane Aerodynamics.** (Also listed as ME 4261) Study of the atmosphere; analysis of incompressible and compressible flows, shock waves, boundary layer and skin friction drag, lift and drag forces over airfoils and wings, and flight performance; aircraft stability and control, wing icing, and parachute-based recovery; history of flight and aerodynamics. Corequisite: ME 3224. No credit for students who have earned credit for 4261. [3]

**ME 5262. Environmental Control.** (Also listed as ME 4262) A study of heating and cooling systems, energy conservation techniques, use of solar energy and heat pumps. No credit for students who have earned credit for 4262. [3]

**ME 5263. Computational Fluid Dynamics and Multiphysics Modeling.** (Also listed as ME 4263) Computational modeling of viscous fluid flows and thermal-fluid-structure interaction. Computational techniques including finite-difference, finite-volume, and finite-element methods; accuracy, convergence, and stability of numerical methods; turbulence modeling; rotating machinery; multiphase flows; and multiphysics modeling. No credit for students who have earned credit for 4263. SPRING. [3]

**ME 5264. Internal Combustion Engines.** (Also listed as ME 4264) A study of the thermodynamics of spark ignition and compression ignition engines; gas turbines and jet propulsion. No credit for students who have earned credit for 4264. [3]

**ME 5265. Direct Energy Conversion.** (Also listed as ME 4265) The principles and devices involved in converting other forms of energy to electrical energy. Conversion devices: electro-mechanical, thermoelectric, thermionic, fluid dynamic, and fuel cell. No credit for students who have earned credit for 4265. [3]

**ME 5267. Aerospace Propulsion.** (Also listed as ME 4267) Application of classical mechanics and thermodynamics to rocket and aircraft propulsion. Design and performance analysis of air-breathing and chemical rocket engines. Advanced propulsion systems for interplanetary travel. Contemporary issues in aerospace propulsion: space exploration, renewable fuels. No credit for students who have earned credit for 4267. [3]

**ME 5271. Introduction to Robotics.** (Also listed as ME 4271) History and application of robots. Robot configurations including mobile robots. Spatial descriptions and transformations of objects in three-dimensional space. Forward and inverse manipulator kinematics. Task and trajectory planning, simulation and off-line programming. No credit for students who have earned credit for 4271. [3]

**ME 5275. Introduction to Finite Element Analysis.** (Also listed as ME 4275) Development and solution of finite element equations for solid mechanics and heat transfer problems. Introduction to commercial finite element and pre- and post-processing software. Two lectures and one three-hour laboratory each week. No credit for students who have earned credit for 4275. [3]

**ME 5280. Advanced Dynamics of Mechanical Systems.** (Also listed as ME 4280) Development of methods for formulating differential equations to model mechanical systems, including formalisms of Newton-Euler, Lagrange, and virtual work methods to two- and three-dimensional systems. No credit for students who have earned credit for 4280. [3]

**ME 5284. Modeling and Simulation of Dynamic Systems.** (Also listed as ME 4284) Incorporates bond graph techniques for energy-based lumped-parameter systems. Includes modeling of electrical, mechanical, hydraulic, magnetic and thermal energy domains. Emphasis on multi-domain interaction. No credit for students who have earned credit for 4284. [3]

**ME 7899. Master of Engineering Project.** [Formerly ME 389]

**ME 7999. Master's Thesis Research.** [Formerly ME 369]

**ME 8320. Statistical Thermodynamics.** [Formerly ME 320] Old and modern quantum theory, including H atom, rigid rotor, and harmonic oscillator. Atomic and molecular structure and spectra. Maxwell-Boltzmann statistical model for ideal, chemically reacting, electron, or photon gas. Introduction to Gibbs method. Prerequisite: ME 2220. [3]

**ME 8323. Introduction to Micro/NanoElectroMechanical Systems.** [Formerly ME 323] Fabrication techniques and mechanical behavior of modern MEMS/NEMS structures. Application of NEMS/MEMS devices to sensing and actuation. [3]

**ME 8326. Gas Dynamics.** [Formerly ME 326] Study of compressible fluid flow from subsonic to supersonic regimes in confined regions and past bodies of revolutions. Includes heat transfer, frictional effects, and real gas behavior. Prerequisite: ME 3224. [3]

**ME 8327. Energy Conversion Systems.** [Formerly ME 327] An advanced study of energy conversion systems that include turbomachinery, positive displacement machinery, solar energy collection and combustion, with consideration for optimizing the systems. [3]

**ME 8331. Robot Manipulators.** [Formerly ME 331] Dynamics and control of robot manipulators. Includes material on Jacobian matrix relating velocities and static forces, linear and angular acceleration relationships, manipulator dynamics, manipulator mechanism design, linear and non-linear control, and force control manipulators. Prerequisite: ME 4271. [3]

**ME 8333. Topics in Stress Analysis.** [Formerly ME 333] An investigation of thermal stress, transient stress, and temperatures in idealized structures; consideration of plasticity at elevated temperatures; and some aspects of vibratory stresses. [3]

**ME 8340. Wireless Mechatronics.** [Formerly ME 340] Design of mechatronic devices with emphasis on miniaturization and wireless transmission of data. Programming of wireless microcontrollers with data acquisition and transmission from sensors and to actuators. Group design project to simulate, fabricate, and test a miniaturized wireless robot. [3]

**ME 8348. Convection Heat Transfer.** [Formerly ME 348] A wide range of topics in free and forced convection is discussed. Solutions are carried out using analytical, integral, and numerical methods. Internal and external flows are considered for both laminar and turbulent flow cases. Convection in high speed flow is also studied. Prerequisite: ME 3248. [3]

**ME 8351. Adaptive Control.** [Formerly ME 351] Introduction to adaptive control systems. Real-time parameter estimation methods. Self-tuning regulators. Model reference adaptive control. Adaptive control for nonlinear systems. A research project is required. Prerequisite: ME 5236. [3]

**ME 8352. Non-linear Control Theory.** [Formerly ME 352] Introduction to the concepts of nonlinear control theory. Topics include phase plane analysis, nonlinear transformations, Lyapunov stability, and controllability/observability calculations. A multidimensional geometric approach to these problems is emphasized. Prerequisite: MATH 2410. [3]

**ME 8353. Design of Electromechanical Systems.** [Formerly ME 353] Analog electronic design for purposes of controlling electromechanical systems, including electromechanical sensors and actuators, analog electronic design of filters, state-space and classical controllers, and transistor-based servoamplifiers and high voltage amplifiers. Significant laboratory component with design and fabrication circuits to control electromechanical systems. Implementation of digital controllers. Prerequisite: ME 3234. [3]

**ME 8359. Advanced Engineering Vibrations.** [Formerly ME 359] The development and application of Lagrange's equations to the theory of vibrations. Nonlinear systems and variable spring characteristics are analyzed by classical methods and by digital computer techniques. Applications to the design of high speed machines are emphasized. Prerequisite: ME 4259; MATH 3120, MATH 4110. [3]

**ME 8363. Conduction and Radiation Heat Transfer.** [Formerly ME 363] A comparative study of available methods for solution of single and multidimensional conduction heat transfer problems. Both steady and transient problems are considered. Mathematical and numerical methods are stressed. Radiant exchange between surfaces separated by non-participating media is studied. Numerical methods are developed and discussed for non-isothermal surfaces and combined radiation and conduction problems are solved. Prerequisite: ME 3248. [3]

**ME 8364. Nanophotonic Materials.** Physics, design, modeling, and applications of nanophotonic materials in modern optical systems.

Topics include waveguides and chip-based photonics, photonic crystals, plasmonics, and metamaterials. [3]

**ME 8365. Micro/Nano Energy Transport.** [Formerly ME 365] Theoretical examination of energy transport by electrons and phonons and modeling of transport phenomena in crystalline solids at reduced length scales. Particle transport models and solution methods for energy carriers in the context of semiconductor electronics, direct energy conversion devices and nanostructure. [3]

**ME 8366. Combustion.** [Formerly ME 366] Introduction to combustion processes. Topics include combustion thermodynamics, chemical kinetics, premixed flame theory, diffusion flame theory, ignition and detonation. Prerequisite: ME 4221, ME 3224. [3]

**ME 8391. Special Topics.** [Formerly ME 391] A course based on faculty research projects and highly specialized areas of concentration. [Variable credit: 1-3 each semester]

**ME 8393. Independent Study.** [Formerly ME 393] Readings and/or projects on advanced topics in mechanical engineering under the supervision of the faculty. Consent of instructor required. [Variable credit: 1-3 each semester]

**ME 8991. Seminar.** [Formerly ME 397] [0]

**ME 8999. Non-Candidate Research.** [Formerly ME 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit 0-12]

**ME 9999. Ph.D. Dissertation Research.** [Formerly ME 399]

## Nanoscience and Nanotechnology

**NANO 3000. Materials Characterization Techniques in Nanoscale Engineering.** [Formerly NANO 250] Principles and applications of advanced materials characterization techniques used to characterize specimens and engineered structures at the nano/microscale. Topics include x-ray diffraction analysis, optical microscopy, electron microscopy, surface probe techniques, focused ion-beam instruments, Rutherford backscatter analysis and chemical microanalytical techniques, treated both qualitatively and quantitatively. Lectures alternate with laboratory on a weekly basis. Prerequisite: MATH 1301; CHEM 1602 or MSE 1500. FALL. [3]

## Scientific Computing

**SC 3250. Scientific Computing Toolbox.** [Formerly SC 250] Use of computational tools in multiple science and engineering domains. Simulations of complex physical, biological, social, and engineering systems, optimization and evaluation of simulation models, Monte Carlo methods, scientific visualization, high performance computing, or data mining. Prerequisite: CS 1101 or 1103; MATH 1100 or higher. FALL. [3]

**SC 3260. High Performance Computing.** Introduction to concepts and practice of high performance computing. Parallel computing, grid computing, GPU computing, data communication, high performance security issues, performance tuning on shared-memory-architectures. Prerequisite: CS 2201 or 2204. SPRING. [3]

**SC 3841. Directed Study in Scientific Computing.** [Formerly SC 293A] Participation in ongoing research projects under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one Director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

**SC 3842. Directed Study in Scientific Computing.** [Formerly SC 293B] Participation in ongoing research projects under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one Director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

**SC 3843. Directed Study in Scientific Computing.** [Formerly SC 293C] Participation in ongoing research projects under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one Director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

**SC 3851. Independent Study in Scientific Computing.** [Formerly SC 295A] Development of a research project by the individual student under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one Director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

**SC 3852. Independent Study in Scientific Computing.** [Formerly SC 295B] Development of a research project by the individual student under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one Director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

**SC 3853. Independent Study in Scientific Computing.** [Formerly SC 295C] Development of a research project by the individual student under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one Director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

**SC 3890. Special Topics in Scientific Computing.** [Formerly SC 290] [1-3 each semester]

**SC 5250. Scientific Computing Toolbox.** (Also listed as SC 3250) Use of computational tools in multiple science and engineering domains. Simulations of complex physical, biological, social, and engineering systems, optimization and evaluation of simulation models, Monte Carlo methods, scientific visualization, high performance computing, or data mining. No credit for students who have earned credit for 3250. FALL. [3]

**SC 5260. High Performance Computing.** (Also listed as SC 3260) Introduction to concepts and practice of high performance computing. Parallel computing, grid computing, GPU computing, data communication, high performance security issues, performance tuning on shared-memory-architectures. SPRING. [3]

**SC 5890. Special Topics in Scientific Computing.** (Also listed as SC 3890) No credit for students who have earned credit for 3890. [1-3 each semester]

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- FRANCIS M. WELLS, Professor of Electrical Engineering, Emeritus  
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- JAMES J. WERT, George A. Sloan Professor of Metallurgy, Emeritus; Professor of Mechanical Engineering, Emeritus  
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- JOHN P. WIKSWO, JR., Gordon A. Cain University Professor; A. B. Learned Professor of Living State Physics; Professor of Biomedical Engineering; Professor of Molecular Physiology and Biophysics  
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- KARL E. ZELIK, Assistant Professor of Mechanical Engineering; Assistant Professor of Biomedical Engineering; Assistant Professor of Physical Medicine and Rehabilitation  
B.S., M.S. (Washington University 2006, 2007); Ph.D. (Michigan 2012) [2014]
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# Peabody College

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# *Education and Human Development at Vanderbilt*

**G**eorge Peabody College for Teachers, recognized for more than a century as one of the foremost independent colleges of teacher education, merged with Vanderbilt University in the summer of 1979 to become Vanderbilt University's Peabody College of education and human development. Since then, Peabody College has retained its heritage while achieving new stature as a place where world-class research is conducted and translated into teaching, practice, policy, and service. Peabody's mission is characterized by practice-oriented academic programs, a strong service ethic, groundbreaking research, and a pressing concern for addressing social problems in domestic and international contexts.

The college's faculty and students constitute a vibrant intellectual community answering pressing questions and expanding knowledge about PreK–12 and higher education, including special education; psychology, especially focused on families and children; the development of individuals and organizations; and educational administration, leadership, and policy. Peabody College understands the preparation of researchers, teachers, and leaders as among the most important things it does, and that building and sustaining an engaged academic community of learners is central to achieving its mission.

Peabody faculty and students engage in a broad spectrum of basic and applied research to generate new knowledge and translate that knowledge into practice. Current research findings inform classroom teaching at Peabody in every program. Moreover, Peabody faculty bring an interdisciplinary and entrepreneurial spirit to the research enterprise. Working collaboratively, often through one of the college's research centers, faculty and students publish and present their findings, apply them in real-world settings, and help to shape public debate about the nature and future of education and human development.

The college is devoted to enhancing opportunity in an increasingly diverse society. More than 1,900 students are enrolled at Peabody, with more than one-third of them in post-baccalaureate graduate or professional degree programs.

All teacher education programs are accredited by the National Council for the Accreditation of Teacher Education (NCATE). Counseling programs are accredited by the Council for the Accreditation of Counseling and Related Education Programs (CACREP).

## Centers and Outreach Efforts

### **Accelerated Academic Achievement (A3) Center**

Funded with a grant of \$10 million by the National Center for Special Education Research, the A3 Center enables researchers to study instructional programs aimed at students with learning disabilities in grades 3 to 5. Scholars affiliated with the center seek to develop and test strategies to improve reading and math success. The new instructional programs developed at the center will help educators address challenges such as how to assist students in progressing to more complex subject matter and how to transfer learning between different intellectual tasks.

### **Center for Research on Rural Families and Communities**

The Center for Research on Rural Families and Communities serves as a change agent in promoting the well-being of families and youth residing in rural communities. It does so by collaborating with community stakeholders to develop and conduct research benefiting community residents; designing preventive interventions that promote positive development, adjustment, and adaptation; implementing efficacy trials and disseminating effective interventions; conducting studies to advance knowledge about social, economic, and environmental impacts on rural culture and rural health disparities; and informing effective policy interventions.

### **Classroom Organization and Management Program (COMP)**

COMP's primary goal is to help teachers improve their overall instructional and behavioral management skills through planning, implementing, and maintaining effective classroom practices. The program also seeks to improve student task engagement and reduce inappropriate and disruptive behavior through well-planned academic tasks and activities.

### **IRIS Center**

The IRIS Center for Training Enhancements was designed in response to a request from the U.S. Department of Education's Office of Special Education Programs. This national effort, serving college faculty working in pre-service preparation programs, aims to ensure that general education teachers, school administrators, school nurses, and school counselors are well prepared to work with students who have disabilities and with their families. IRIS is the nation's only faculty enhancement center established for this purpose.

### **National Center for Leadership in Intensive Intervention**

The National Center for Leadership in Intensive Intervention prepares special education leaders to provide intensive intervention to students with disabilities who have persistent and severe academic and behavioral difficulties. Funded by the Office of Special Education Programs, the center is composed of a consortium of universities including Vanderbilt, Southern Methodist University, the University of Connecticut, the University of Illinois at Chicago, the University of Minnesota, the University of Texas at Austin, and Virginia Commonwealth University.

### **National Center on Performance Incentives**

The National Center on Performance Incentives (NCPI), a national research and development center, was established in 2006 by a \$10 million grant from the U.S. Department of Education Institute of Education Sciences. NCPI conducts randomized field trials and program evaluations to address one of the most contested questions in public education: Do financial incentives for teachers, administrators, and schools affect the quality of teaching and learning?



### National Center on Scaling Up Effective Schools

The National Center on Scaling Up Effective Schools is a collaborative partnership of research universities, education support providers, and two large urban school districts to identify the essential programs, practices, processes, and policies that make some high schools particularly effective with low-income students, minority students, and English language learners. The center works with teachers and school district leaders to share these practices with less-effective schools.

### Next Steps at Vanderbilt

Next Steps at Vanderbilt is a two-year, nonresidential certification program for students with intellectual and developmental disabilities, providing individualized programs of study in the areas of education, social skills, and vocational training. Next Steps is a comprehensive transition program designated by the U.S. Department of Education. This status recognizes the program's merits and allows eligible students to apply for federal financial aid for tuition assistance.

### Peabody Journal of Education

The *Peabody Journal of Education*, an interdisciplinary scholarly publication, fosters the development and dissemination of knowledge related to important questions of education and human development. The journal, in publication since 1923, is published quarterly and distributed across the United States and in twenty-five foreign countries.

### Peabody Professional Institutes

Peabody Professional Institutes (PPI) provide short-term, intensive educational experiences for professional educators and administrators from across the nation and around the world. Each institute draws from social science disciplines and professional fields of study to inform the creation of a comprehensive, yet focused, curriculum. Designed with the same expectations for rigor and depth as Peabody College degree programs, PPI rest on the philosophy that good practice is best derived from and informed by a strong theoretical base.

### Peabody Research Institute

The Peabody Research Institute (PRI) conducts research aimed at improving the effectiveness of programs for children, youth, and families. This mission encompasses educational programs and other interventions aimed at increasing the well-being of children and their families. Research may address any aspect of relevant practices, programs, or policies—e.g., their effectiveness, implementation, costs, dissemination, or social/political support—but the emphasis is on evaluating their effects on the children and families they serve. To bridge between research and practice, PRI also provides technical assistance and consultation to programs, practitioners, and policy makers aimed at improving services for children and families.

### Principals Leadership Academy of Nashville

The Principals Leadership Academy of Nashville is a joint undertaking of Peabody, the Nashville Public Education Foundation, and Metropolitan Nashville Public Schools. The academy develops educational leaders for the Nashville school system who are creative and courageous professionals capable of encouraging the best practices in teaching and learning.

### Study of Mathematically Precocious Youth

The Study of Mathematically Precocious Youth (SMPY) is a fifty-year longitudinal study of five cohorts, consisting of more than 5,000 intellectually talented individuals, identified over a twenty-five-year period (1972–1997). The aim of this research is to develop a better understanding of the unique needs of intellectually precocious youth and the determinants of the contrasting developmental trajectories they display over the lifespan.

### Susan Gray School for Children

The Susan Gray School for Children is an inclusive early childhood education program serving young children with and without disabilities, on site and in the community. The mission of the Susan Gray School is to provide high-quality services to children, families, and the community; to help train university students who plan to be teachers, health care providers, therapists, and researchers; to facilitate research; and to demonstrate high-quality early childhood education and special education practices.

### Vanderbilt Center for Science Outreach

The Vanderbilt Center for Science Outreach (CSO) is dedicated to enhancing literacy in science, technology, engineering, and mathematics (STEM) through the establishment of unique partnerships between university scientists, K–12 educators and students, and the local and global science community. CSO has developed and implemented a number of education programs in partnership with local and national K–12 classrooms, including the School for Science and Math at Vanderbilt. These efforts have reached thousands of children, supported teachers in residence on the Vanderbilt campus, hosted summer professional development courses and workshops for teachers, offered summer programs for students, and placed teachers and students in research laboratories. As a national leader in outreach efforts, the CSO is committed to elevating pre-collegiate STEM expertise and literacy.

### Vanderbilt Kennedy Center for Research on Human Development

The Vanderbilt Kennedy Center is one of fourteen national centers for research on intellectual disabilities and developmental disorders. Its primary mission is to better understand human development, to prevent and solve developmental problems, and to enable persons with developmental disabilities to lead fuller lives. The Kennedy Center is a university-wide center with institutional support shared by Peabody College, the School of Medicine, and the College of Arts and Science.

### Vanderbilt Programs for Talented Youth

Vanderbilt Programs for Talented Youth seeks to identify and aid academically talented youth from diverse educational, racial, and economic backgrounds by providing academic enrichment and challenge, while fostering balance and healthfulness in their lives. Begun in 2000 as a summer residential academic program, Programs for Talented Youth has expanded its mission and programming to provide engaging and intellectually appropriate educational opportunities to precocious young students, and to offer support for parents and educators year-round.

## The Undergraduate Program

PEABODY College offers the bachelor of science with majors in early childhood education, elementary education, secondary education, special education, cognitive studies, child development, child studies, and human and organizational development. These undergraduate programs are designed to prepare students for professional careers in their chosen fields. Programs for Peabody students include course work in a Liberal Education Core, a professional core, a major area of specialization, and electives. Peabody also provides professional education courses for College of Arts and Science students who want to prepare for teacher licensure.

The bachelor of science is granted on the basis of 120 semester hours of college work with a final grade point average of 2.000, and completion of the Liberal Education Core and the requirements of the major.

### Liberal Education Core Program

In pursuit of breadth of knowledge and understanding about the world in which they live, all undergraduates complete the requirements of the Liberal Education Core program. This Liberal Education Core component of all Peabody undergraduate majors is intended to provide students with a solid foundation in the arts and sciences. The core curriculum incorporates the study of human conditions that are universal. The Liberal Education Core involves study in the following areas:

*Communications.* The study of language in its written and spoken forms.

*Mathematics.* The study of mathematical concepts and procedures.

*Social Sciences.* The study of the past—both the heritage of the United States and the more global human story. The study of growth and development of individuals.

*Humanities.* The study of the universal language of the arts.

*Natural Sciences.* The study of scientific process and inter-relationships among the sciences.

Through the study of these universal subjects, concepts, and modes of thought, students gain a broad foundation transferable to their futures. They will continue to grow within society and the classroom and will look at problems from different perspectives while maintaining curiosity.

Courses identified to fulfill the Liberal Education Core requirement for each undergraduate major are listed in Peabody's *Undergraduate Handbook* (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Courses used to satisfy these core requirements may also be counted toward the fulfillment of requirements in an academic major. Special topics courses are ordinarily not acceptable for meeting Liberal Education Core requirements. These courses require prior approval as substitute courses. Independent study courses are not acceptable for meeting Liberal Education Core requirements.

Transfer students may use credits from other colleges to fulfill Peabody's Liberal Education Core requirements if the credits are equivalent to the courses offered at Vanderbilt. The use of transfer courses to satisfy Liberal Education Core requirements must be approved by the Dean's Office. For transfer students, credits are evaluated when the student enrolls at Peabody in order to determine which transfer courses will substitute for Peabody's Liberal Education Core requirements. Requirements still to be fulfilled will be noted at that time.

# Licensure for Teaching

PEABODY offers programs leading to teacher licensure in the following areas: *early childhood (grades PreK–3), elementary (grades K–5), and secondary education (grades 6–12) with endorsement in English, math, biology, chemistry, physics, earth science, history, and political science.* (Added endorsements are available also in *economics, psychology, and sociology for those who will have a history endorsement.*) An added endorsement program also is available in *English as a Second Language (grades PreK–12)*. All of these programs are offered by the Department of Teaching and Learning.

*Special education–interventionist (LD/BD for grades K–8 or 6–12), comprehensive (multiple/severe for grades K–12), or visual impairment (grades PreK–12).* All three of these programs are offered by the Department of Special Education.

Vanderbilt’s Blair School of Music and Peabody College offer a program for students interested in teacher licensure with endorsement in the following: (1) *instrumental/general music (grades K–12), or (2) vocal/general music (grades K–12)*. Blair students complete the first part of the program as part of the bachelor of music degree and apply during the senior year to continue into the master of education degree for a final year of professional education.

Students seeking licensure may enroll in Peabody College, the College of Arts and Science, or the Blair School of Music. In all cases, most of the liberal arts course work is taken in the College of Arts and Science, and the professional education course work is taken at Peabody College.

All students completing a teacher education program at Vanderbilt are strongly advised to apply for a license in Tennessee whether or not they plan to teach in this state. In addition, licensure is available by application in other states. The student is responsible for applying for licensure through the Office of Teacher Licensure located in the Peabody Administration Building. Each state has its own application forms and procedures for licensure; information is available in the Office of Teacher Licensure.

Licensure requirements continue to undergo revision. Students must meet licensure requirements in effect at the time of their program completion, which may be different from requirements in effect at the time they entered the program. Each year, teacher education students should consult the current Vanderbilt *Undergraduate Catalog* or the Peabody *Undergraduate Handbook* available in the Office of Academic Services in the Peabody Administration Building. The licensure website ([peabody.vanderbilt.edu/admin-offices/teacher-licensure/index.php](http://peabody.vanderbilt.edu/admin-offices/teacher-licensure/index.php)) provides additional information.

## Security Clearance

During the first two weeks of enrollment in a teacher preparation program, a student must pay a \$38 fee and be fingerprinted in Tennessee by Identigo for a criminal background check by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation. The student must register online to pay the fee and to specify that the clearance report will be sent to the following Vanderbilt ID code: ORI TNCC19116. Before background clearance, the student must read the Background Clearance Consent/FERPA Form. The student must complete an online data entry form acknowledging their agreement to the conditions listed in the Consent/FERPA Form. Among other agreements is the

expectation to notify the Peabody background clearance officer if an infraction occurs at any time during enrollment in the program. Contact the Office of Background Clearance at Peabody ([bco@vanderbilt.edu](mailto:bco@vanderbilt.edu)) or visit [vu.edu/peabodybco](http://vu.edu/peabodybco) for additional information.

## Degree Audits

Electronic degree audits enable students and faculty advisers to track each student’s progress in the degree program at Peabody. The departmental handbooks describe access to and use of online Peabody major degree audits to view program requirements recognized as “met” or “unmet” at any time in the student’s program. The degree audit also denotes permissions for waivers or course substitutions. Degree audits are managed in the Peabody Office of Academic Services.

## SCREENING

There are two points in each teacher education program when undergraduates must complete applications for screenings by departmental faculty. Screening requirements continue to undergo revision and are subject to change. Students must meet screening requirements in effect at the time of their application, which may be different from requirements stated below. Screening reviews, described below, are important checkpoints that allow successful students to advance in the program. Attainment of 2.75 (4.0) cumulative grade point average and completion of required courses do not automatically qualify a student for continuation in the program.

Faculty evaluation of a student’s qualifications for continuation in a teacher education program include academic, performance, and disposition factors such as the following:

1. Dependability (as evidenced by good attendance in classes and practica and the completion of required assignments and procedures on time)
2. Professional and ethical behavior (honesty, acceptance of responsibility, emotional maturity, etc.)
3. Attitude and interpersonal skills (including the ability to work with children and with peers)
4. Academic competence (It is possible for a student to meet minimum grade point requirements and pass all courses and still have specific academic weaknesses which might cause denial of screening applications.)

Students seeking teacher licensure must be approved by each department through which licensure is sought. Secondary licensure candidates should contact an adviser or the director of undergraduate studies in the appropriate Arts and Science department(s) to be informed of any specific departmental requirements or standards.

5. Teaching competence (as evidenced by successful completion of practica requirements). It is possible for a student to meet minimum grade point requirements and pass all courses and still have specific performance weaknesses which might cause denial of screening applications.

These criteria rest on the professional judgment of faculty members. Whether a student meets them or not is determined

by a vote of appropriate faculty. Undergraduate students seeking secondary education licensure must be approved by the Department of Teaching and Learning faculty and also by the faculty of College of Arts and Science department(s) for the Arts and Science major(s).

Screening deadlines are October 1 and February 1. Undergraduates must apply for Screening I during spring of the sophomore year or fall of the junior year. Screening II must be done in the fall of the senior year, restricting undergraduate student teaching in special education and secondary education to the spring of the senior year.\* Deadlines are firm; late applications will not be accepted. The Screening I and II application form is online at [peabody.vanderbilt.edu/admin-offices/teacher-licensure/licensure\\_for\\_undergraduate\\_students/screening.php](http://peabody.vanderbilt.edu/admin-offices/teacher-licensure/licensure_for_undergraduate_students/screening.php) and should be submitted online no later than the deadline.

(NOTE: Screening II applications require additional documents when submitted. See specific requirements with the application.)

Students will be notified of results of the faculty vote at the end of the screening semester. In instances where there is a negative decision, the student wishing to appeal must do so in writing to the chairperson(s) of the department(s) denying the application. If the initial decision is upheld and the student wishes to continue the appeal, a written petition should be filed with the Administrative Committee of Peabody College.

\* Screening II applications for student teaching in Early Childhood or Elementary Education may be submitted in the second semester of the junior year for fall student teaching.

### Screening I (Formal Admission to an Undergraduate Teacher Education Program)

Each student seeking teacher licensure must be formally admitted to the teacher education program(s) by completing an online application for Screening I review by the faculty of the department(s) in which endorsement(s) is/are sought. Candidates normally apply for Screening I during spring of the sophomore year or fall of the junior year, depending on their program area (candidates should consult their department handbook for timelines in their program area). Deadlines are February 1 in the spring and October 1 in the fall. Students who transfer more than 60 hours to Vanderbilt from another institution must apply for admission to the teacher education program by the screening deadline of their second semester at Vanderbilt.

An initial screening review by the faculty will occur soon after the Screening I deadline. If there are concerns noted, the student will be counseled. The final faculty review and decision will be done toward the end of the semester.

Criteria for Screening I (formal admission to teacher education) are:

#### A. Specific Academic Criteria

1. Test scores (SAT 1020 or ACT 21 OR passing scores on the Praxis I Core Academic Skills for Educators)
2. Minimum cumulative grade point average of 2.75 (4-point scale)
3. Successful completion of at least two of the required professional education courses as defined by the program area with a minimum grade of C
4. Department interview

#### B. Specific Faculty Evaluative Criteria

The faculty will consider the disposition criteria of dependability, professional and ethical behavior, attitude and interpersonal skills, and teaching competence as itemized at the beginning of the Screening section.

### Screening II (Admission to Student Teaching)

Admission to Student Teaching is not automatic when prerequisite course work and field experiences have been completed. Special education majors and secondary education majors must submit the online Screening II application in the fall of the senior year. For elementary majors and early childhood majors in the Department of Teaching and Learning, the student must submit the online Screening II application the semester prior to the one during which a student is to student teach. Secondary education majors may student teach in spring semesters only, so they must apply for Screening II in the fall semester of their senior year. Deadlines are October 1 for fall semesters, February 1 for spring semesters. At the time of screening application, the student should be enrolled in any remaining prerequisite courses. **No course work may be taken during the semester of student teaching and seminar.**

After an initial review in the Office of Teacher Licensure, the Screening II application and other submitted materials will be considered by departmental faculty according to the following criteria for Screening II approval to student teach:

#### A. Specific Academic Criteria

1. Formal admission to a teacher education program granted (completion of Screening I)
2. Second semester junior standing (for student teaching in the fall of the senior year) or first semester senior standing (for student teaching in the spring of the senior year)
3. Successful completion (C or above) of all courses required and prerequisite to student teaching as defined by the program area
4. Minimum cumulative grade point average of 2.75 (4.0 scale)
5. Satisfactory performance (C or above) in coursework in areas in which teacher licensure is sought
6. Successful completion of Standard First Aid and CPR training (attach certificate copies to the Screening II application)

#### B. Specific Faculty Evaluative Criteria

The faculty will consider the disposition criteria of dependability, professional and ethical behavior, attitude and interpersonal skills, and teaching competence as itemized at the beginning of the Screening section.

Each Screening II application requires additional documents, depending on the program. A copy of first aid and CPR verification of training completed within the previous two years must be submitted to the Office of Teacher Licensure by the October 1 or February 1 deadline. In addition, some programs have additional requirements that are prerequisite to Screening II application. Students should consult departmental handbooks. Screening II applicants who are approved to student teach will receive notification of their student teaching placements no later than during the Student Teacher Orientation at the beginning of the student teaching semester.

Students who have passed Screening II are assigned two specific student teaching placements in the Nashville area.

## Student Teaching

Vanderbilt students seeking teacher licensure must successfully complete a 15-week semester of full-time student teaching in two different grade levels in Nashville area public schools and must be recommended for licensure by the supervisors of student teaching and departmental faculty. Students seeking early childhood or elementary licensure may apply for fall or spring student teaching. Secondary education and special education student teaching may be done only in the spring semester. Prior to the start of student teaching, all prerequisite courses must have been completed, the cumulative GPA must be at least 2.75, and the appropriate departmental faculties must have voted to approve the candidate for student teaching during the previous semester as part of the Screening II application process. The Tennessee State Department of Education and Metropolitan Nashville Public Schools prohibit student teachers from taking courses during student teaching. See the departmental *Undergraduate Handbook* for details.

## Application for Teacher Licensure and University Recommendation for Licensure

All students completing the teacher education program at Vanderbilt are strongly advised to apply for a license in Tennessee whether or not they plan to teach in this state. In addition, licensure is available in most other states. The student is responsible for applying for licensure through the Office of Teacher Licensure located in the Peabody Administration Building. Each state has its own application forms and procedures for licensure; information is available in the Office of Teacher Licensure.

To be licensed through Vanderbilt's teacher education program, a graduate must earn a positive licensure recommendation from the University. The University's decision to recommend a candidate is based upon the following:

1. Maintaining the grade point average required for admission to the teacher education program (2.75 on a 4.0 scale).
2. For Tennessee licensure, achieving the state minimum score on all required parts of the PRAXIS II Series (scores must be sent to the Vanderbilt Office of Teacher Licensure—code R 1871, and the Tennessee Department of Education—code R 8190).\*
3. Receiving a positive recommendation from the student's department as a result of the student teaching experience (Pass in student teaching does not guarantee a favorable recommendation).

\* Testing requirements are changing almost annually; check instructions in the Office of Teacher Licensure or at [peabody.vanderbilt.edu/admin-offices/teacher-licensure/index.php](http://peabody.vanderbilt.edu/admin-offices/teacher-licensure/index.php) before registering to take the exams.

## Accreditation

Vanderbilt University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award bachelor's, master's, professional, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call (404) 679-4500, or visit [sacscoc.org](http://sacscoc.org) for questions about the accreditation of Vanderbilt University.

Please contact the commission only in relation to Vanderbilt's noncompliance with accreditation requirements. Normal inquiries about admission requirements, educational programs, and financial aid should be directed to the university.

Vanderbilt is accredited by the National Council for Accreditation of Teacher Education (NCATE). Its teacher licensure programs also are approved by the Tennessee Department of Education and the following specialty professional associations:

- National Council for Teachers of English (NCTE)
- Council for Exceptional Children (CEC)
- National Association for the Education of Young Children (NAEYC)
- Association for Childhood Education International (ACEI)
- Council for the Accreditation of Counseling and Related Education Programs (CACREP)
- National Association for Schools of Music (NASM)

# Academic Regulations

## Honor System

All academic work at Vanderbilt is done under the honor system. (See the Honor System section in Life at Vanderbilt.)

## Academic Advising

Each Peabody undergraduate is assigned an academic adviser who is familiar with his or her major. This adviser is generally a faculty member in the major department and is knowledgeable about the courses the student will need to complete his or her major. The adviser helps the student determine the courses that are most suitable for the chosen major and serves as a mentor to the student.

However, enrollment in appropriate courses to fulfill degree requirements and knowledge of university policies and regulations regarding courses are the responsibility of the individual student.

## Class Attendance

Students are expected to attend all scheduled meetings of classes in which they are enrolled; they have an obligation to contribute to the academic performance of all students by full participation in the work of each class. At the beginning of the semester, instructors explain the policy regarding absences in each of their classes, and thereafter they report to the office of the dean of the college the name of any student whose achievement in a course is being adversely affected by excessive absences. In such cases, the dean, in consultation with the instructor, takes appropriate action, which may include dropping the student from the class; students dropped after the deadline for withdrawal receive the grade *F*. Class attendance may be specified as a factor in determining the final grade in a course, and it cannot fail to influence the grade even when it is not considered explicitly.

## Course Load

A student must be enrolled in a minimum of 12 hours to be classified as a full-time student. Students wishing to carry more than 18 hours must obtain the approval of the dean of Peabody Student Affairs Office. All undergraduate students are assumed to be full-time students for the purpose of administering probation and retention policies. A student who for reasons of health, family, or outside employment wishes to enroll in Peabody as a part-time student must obtain permission from the dean of Peabody Student Affairs Office. The academic standing of such students will be considered on an individual basis. Normally, however, a student earning less than 12 hours will either be placed on academic probation or issued an academic warning.

## Residence Requirement

Students must complete a minimum of 60 hours in residence at Vanderbilt including the final two semesters.

## Credit by Examination

In certain circumstances students may be awarded course credit by departmental examination. (This procedure is distinct from the award of credit through the College Board Advanced Placement Tests taken prior to a student's first enrollment.)

Students wanting to earn credit by departmental examination should consult the Peabody Office of Academic Services concerning procedures. To be eligible, students must be carrying a minimum of 12 hours and be in good standing.

Students must obtain the approval of the chair of the department that is to give the examination and the instructor designated by the chair. Students may earn up to 30 hours of credit by any combination of credit through advanced placement examinations and credit by departmental examination. Students may earn up to 8 hours of credit by examination in any one department. Students may attempt to obtain credit by examination no more than twice in one semester and no more than twice in one course. Students may not repeat a course for grade replacement under the credit by examination procedures.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 hours are not charged extra tuition for hours earned through credit by examination, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses and courses dropped after the change period. Students in this category must pay a \$50 fee for the cost of constructing, administering, and grading the examination. Since this cost has already been incurred, students who refuse the credit hours and grade are charged the \$50 fee nevertheless.

Full-time students with a tuition load exceeding 18 hours and students taking fewer than 12 hours pay tuition at the hourly tuition rate.

## Liberal Education Core Guidelines

Applicants to Peabody College will be required to take the SAT I or ACT writing test and the SAT II mathematics test. Human and organizational development majors do not need the SAT II mathematics test. The following application of these scores will be made to the Peabody Liberal Education Core:

### *Writing Requirement:*

All Peabody College freshmen who have not earned a combined score of 1220 on the writing and critical reading components of the SAT I with a minimum score of 500 in each component, or ACT English test score of 27 or above and a minimum writing score of 7 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

First-year seminars (courses labeled 1111) offered through the College of Arts and Science and Blair School of Music may count as writing-intensive courses. Peabody freshmen may register for first-year seminars when open registration begins.

### Mathematics:

Students with first majors in early childhood, elementary, secondary, or special education with an SAT II Mathematics test score at or above 620 (Level I) or at or above 570 (Level II) are exempt from three hours of the math component of the Liberal Education Core mathematics category. Students with an exemption must take an additional three credit hours in their Liberal Education Core elective category to have the minimum required sixty-hour core. Students must take a statistics course if required for their major.

Students with first majors in child development, child studies, cognitive studies, or human and organizational development must take six hours as stated in the Liberal Education Core mathematics category.

### Undergraduate Enrollment in 5000–8000-level Courses

All students wishing to take 5000–8000-level courses for either undergraduate or graduate credit must obtain the written approval of their academic advisers, the instructor of the course, and the Office of Academic Services. Some courses are designed to enroll both undergraduate and graduate/professional students in the same class section. Such courses will typically have two course numbers, one in the graduate range (5000–8000) and one in the undergraduate range (usually either 3000– or 4000–level). Unless they wish to take the course for post-baccalaureate credit, undergraduates must register for the course using the undergraduate course number and may do so without any special permission. Undergraduates wishing to receive approval for graduate credit in 5000–8000-level courses also see below.

### Undergraduate Enrollment for Post-Baccalaureate Credit

A qualified Vanderbilt University senior undergraduate may enroll in courses approved for post-baccalaureate credit and receive credit which, upon the student's admission into a Peabody College professional program, may be applicable toward the professional degree. The principles governing this option are as follows:

1. Work taken under this option is limited to those 5000–8000-level courses approved for post-baccalaureate credit, excluding thesis and dissertation research courses and similar individual research and readings courses.
2. Such work must be in excess of that required for the bachelor's degree.
3. At the time of registration, the student must have a *B* average in all prior work to be counted toward the bachelor's degree, or a *B* average in all prior work to be counted toward the undergraduate major, or a *B* average in the preceding two semesters.
4. Undergraduate students wishing to count for post-baccalaureate credit courses taken under this option must consult the instructor of each course and must, at the time of registration, declare their intention on a form available at the Office of Academic Services.
5. The student's total course load (graduate plus undergraduate courses) must not exceed 15 hours during any semester in which graduate credit is pursued.
6. Permission for Vanderbilt undergraduates to enroll in post-baccalaureate courses does not constitute a commitment on the part of any department to accept the student

in the future. Courses taken under this option are subject to departmental approval before they may be included on post-baccalaureate programs of study.

7. An undergraduate student exercising this option will be treated as a post-baccalaureate student with regard to class requirements and grading standards.

Interested students should consult the Peabody Office of Academic Services to verify their eligibility as defined above before attempting to register for post-baccalaureate course work under this option.

### Undergraduate Enrollment for an Independent Study

Independent study courses, ranging from one to three hours of credit, are listed in the *Schedule of Courses* and are intended for students in their junior and senior years. Students wanting to undertake an independent study must follow these guidelines:

1. Students must be in academic "good standing" (may not be on probation or Leave of Absence).
2. Students must arrange the independent study with a Vanderbilt full time faculty member who has agreed to supervise and grade this experience.
3. Students may enroll for up to 3 hours of independent study in one semester.
4. Students must make a written study plan detailing the nature of the project and the amount of credit. The Individual Learning/Directed Study contract must be approved by the instructor and the department chair (or the chair's designee) by the last day of the change period.
5. Registration for the course occurs when the completed Individual Learning/Directed Study contract is submitted to the Peabody Office of Academic Services. Registration for an independent study will not be allowed after the change period has ended.

Students may not repeat independent study courses for grade replacement.

### Transfer Credit/Summer Courses Off Campus

Students who transfer from another institution must have a final transcript sent directly to the Undergraduate Admissions Office, Vanderbilt University. Upon acceptance, students will be asked to submit course descriptions and syllabi for all proposed transfer credit. The Peabody Office of Academic Services, in consultation with other appropriate academic units, will evaluate the course work to determine which credits will transfer and which requirements (e.g., Liberal Education Core, professional core) are met by the transfer courses. No course for which a student received the grade *D+* or lower will transfer. Course work transferred to Vanderbilt from another institution will not carry with it a grade point average.

Transfer students must complete at least 60 hours of work at Vanderbilt. Two of the four semesters in residence must be the last two semesters of the student's degree program.

Peabody students who wish to take course work during the summer at a four-year, regionally accredited college or university and transfer up to 12 hours to Vanderbilt must be in good standing with at least a *C* average. Prior approval from the Peabody Office of Academic Services must be granted for all courses to be taken elsewhere. Course work transferred to Vanderbilt from another institution will not carry with it a grade point average.

Students who wish to participate in a non-Vanderbilt overseas program should complete the appropriate transfer of credit forms and apply for a leave of absence for the relevant semester. To qualify for such a leave, a student must be in good standing with at least a 2.700 grade point average as of the date of application. Students must obtain prior approval for the leave of absence and for up to 15 hours of credit to be taken in the other program if the credit is to be transferred to Vanderbilt. Petitions for leaves of this type must be filed at least one month before the close of the preceding semester. Final approval of leaves of absence always rests with the Dean's Office. All students traveling abroad must register their trips through International SOS. It should be noted, however, that if a program has been approved for direct credit by Vanderbilt, it must be taken as the approved direct-credit program by matriculated Vanderbilt students. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved direct-credit program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt.

### Declaration of Major and of Second Major

Peabody students declare a major as part of the application process prior to admission. In their first semester, Peabody freshmen are expected to take coursework recommended for the major into which they were admitted. Students wishing to change into a different major within Peabody cannot declare this change until March of their first year, to take effect in fall of their second year. Second majors must be declared no later than the second semester of the sophomore year. Also during the sophomore year, students majoring in secondary education, special education, and human and organizational development will be required to declare their area of specialization or track.

### Overlap in Course Work between Multiple Majors and Minors

Students pursuing multiple majors and/or optional minors are limited in the amount of course work that can be shared across their major and minor programs of study. If the major or minor is offered through a school other than Peabody, the amount of course work that can be shared between that major or minor and other majors or minors is determined by that school's policies. For a major offered through Peabody College, at least 21 credit hours need to be unique to that major. That is, 21 hours within the major cannot be used to count toward any other major or minor. For a minor offered through Peabody College, at least 15 hours need to be unique to that minor.

### Senior Re-examination

A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed prevents the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from reexamination.

The re-examination must be requested through the Office of the Associate Deans, and if approved, it is given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination will receive a D- in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course.

### Grading System

Peabody College undergraduate students are on a four-point grading system. All work is graded by letters, interpreted as follows:

- A: excellent
- B: good
- C: satisfactory
- D: minimum pass work
- F: failure

Under certain circumstances the following grades may be awarded:

- W: withdrawal
- P: pass (see Pass/D/Fail course provision)
- M: missed final examination
- I: incomplete in some requirement other than final examination
- MI: missed final examination with additional incomplete requirements

Plus and minus modifiers may be associated with the letters A through D as shown in the table below. Grade point averages are calculated using indicated grade point values.

### Defined Grades with Corresponding Grade Points per Credit Hour

A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
C+	= 2.3	F	= 0.0

### Grade Point Average

A student's grade point average is obtained by dividing the grade points earned by the hours for which the student has registered, excluding courses taken for no credit, those from which the student has withdrawn, and those that are completed with the grade P.

### Audit

Regularly enrolled Peabody College students who want to audit courses in any of the undergraduate schools of the university must obtain the written consent of the instructor to attend the class but do not register for the course for credit. Forms are available from the Peabody Office of Academic Services, 216 Peabody Administration Building. No permanent record is kept of the audit. Regular students may audit one class each semester free of charge.

### Pass/Fail

Students may elect to take some courses in which they can receive the grade P (Pass). This grade is entered for the student enrolled under the P/F option who is awarded a grade of D- or higher. The grade P is neither counted in the grade point average nor used in the determination of honors. A failing grade will appear on the student record as F and will be counted in the student's grade point average.

To be eligible for the P/F option, the student must have completed two regular semesters at Vanderbilt and must not be on academic probation. No more than one course per semester may be taken on a P/F basis and no more than three total during the undergraduate career. No more than one course from any Liberal Education Core area (e.g., communications, humanities) may be taken under this option.

The P/F option does not apply to courses in the following categories:



1. Liberal Education Core Courses that have been specifically identified by the student's primary major as needing to be taken on a graded basis. By program, these courses are:

Human and Organizational Development: Courses taken to satisfy the 3-hour Liberal Core Economic requirement (i.e., Econ 1010, 1020, HOD 2260);

Child Development, Child Studies, and Cognitive Studies: Courses taken to satisfy the 3-hour Liberal Core Statistics requirement (i.e., Econ 1500, PSY-PC 2110, Psy 2100).

Special Education: PSY-PC 1250, PSY-PC 2600, EDUC 1220, SPED 1210, SPED 2120, SPED 2430, SPED 2160, SPED 3348.

Early Childhood Education: ENED 2430, EDUC 3750, ENED 2100, MTED 2100, PSY-PC 1250, SSED 2100.

Elementary Education: ENED 2430, EDUC 3750, 2200, MTED 2200, SCED 2200, PSY-PC 1250.

Secondary Education: PSY-PC 2550.

2. For students with a single or double major, courses in the department(s) of the major(s) or other courses that may be counted for the major(s);
3. For students with an interdisciplinary major, courses listed in the student's plan of study;
4. For students planning an optional minor, courses in the department of the minor or those counting toward an interdisciplinary minor.

Students taking a course on a P/F basis must be enrolled for at least 12 hours on a regularly graded basis. If a student drops a course and falls below 12 graded hours, the P/F course is converted automatically to a regularly graded basis.

Seniors who meet the above criteria and have permission to take fewer than 12 hours on a graded basis may take one course on a P/F basis in one of their last two semesters (e.g., a semester in which an internship or student teaching is not being taken). If the student does not graduate at the end of the senior year, the grade of P is automatically converted to the grade actually earned.

All P/F students are expected to meet normal course requirements (e.g., reports, papers, examinations, laboratory attendance) and are graded in a normal way. At the end of the semester, students enrolled on a P/F basis are awarded a regular grade. Any grade of D- or better is converted in the Student Records System to a P, while an F grade remains as awarded. A student taking a course on a P/F basis must meet the course prerequisites as set forth in this catalog.

Students register for a course on a P/F basis on a Pass/Fail Declaration form available in 216 Peabody Administration Building during a registration appointment window or during open enrollment. After the first week of classes, students may change from a P/F basis to a regularly graded basis—but not from a regularly graded basis to a P/F basis—until the end of the eighth week of classes. These deadlines are published in the calendar. When a student wishes to complete a major or minor in a field in which a grade of P has been received, the registrar converts this grade to the regular grade originally earned.

### Credit Hour Definition

Credit hours are semester hours; e.g., a three-hour course carries credit of three semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements which exceed this definition. Certain courses (e.g., dissertation research,

ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester will be included in the course description.

### Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. A student who receives a temporary grade is ineligible for the Dean's List. Students may not graduate with temporary grades still remaining on their academic records.

#### *I: Incomplete*

An Incomplete is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The I is not intended as a replacement for a failing grade, nor should it be given to a student who misses the final examination. The M grade is used for the latter purpose. The request for an Incomplete is initiated by the student and must be approved by the instructor. In assigning the grade of I, the instructor specifies (a) a default grade that counts the missing work as zero and (b) a deadline by which the missing work must be submitted. That deadline must be no later than the last class day of the next regular semester in residence. The Incomplete can be extended beyond the next semester only if the student's associate dean determines that an extension is warranted. If the required work is submitted by the deadline for removing the Incomplete, the I will be replaced by the grade earned. If the work is not completed by the deadline, the default grade will become the permanent grade for the course.

The Incomplete is not calculated in the GPA, but a student who receives an Incomplete is ineligible for the Dean's List.

#### *M: Missing a Final Examination*

The grade M is given to a student who misses a final examination, provided the student could pass the course if the final examination is successfully completed. The grade of F is given if the student could not pass the course even with the final examination.

It is the student's responsibility to contact the Dean's Office before the first day of the next semester, regardless of whether the student will be in residence that semester, to request permission to take a makeup examination. If a request has not been submitted by the proper time, or if the student fails to take the makeup examination within the prescribed time, the M grade will be replaced by an F.

#### *MI: Missing a Final Examination and Other Work*

The grade MI is assigned to a student who misses the final examination and whose work is incomplete in other respects. The MI may not be turned in without prior authorization by the dean. It is the student's responsibility to contact the Dean's Office to request permission to take a makeup examination and to arrange for submission of the missing work.

#### *Withdrawal*

The symbol W (withdrawal) is assigned in lieu of a grade when a student formally withdraws from a class before the published mid-semester deadline. After that point, withdrawal will result

in an F. A student who withdraws from school for reasons such as illness, unusual personal or family problems, and the like, may petition the Dean's Office for an authorized administrative withdrawal. If approved, the student will receive the grade W for courses in progress. A student who withdraws from school without an authorized administrative withdrawal receives the grade W or F depending upon the date of withdrawal. The grade W is not included in the calculation of the grade point average.

### **Dead Week**

Because Peabody classes integrate theory and practice, many courses include significant semester-long group and individual projects that culminate in papers, presentations, simulations, or other activities at the end of the semester. Therefore, while instructors are discouraged from scheduling quizzes, tests, or short-term assignments for the last week of the semester, Peabody's "dead week" policy does not prohibit assignments during the week before finals.

### **Repeat Courses**

If a course is repeated, only the last grade and credit hours earned will be used to calculate the grade point average and be creditable toward graduation. However, the original grade will appear on the transcript. Certain courses (e.g., special topics courses, directed study courses; see duplicate content section, below) may be repeated for credit when there is no duplication of content. Such courses may be repeated to replace a grade only when the content of the original and repeated courses is the same. Courses must be repeated in a graded status. This policy also applies to Advanced Placement credit.

### **Duplication of Course Content**

It is the responsibility of the individual student to avoid duplication in whole or in part of the content of any courses offered toward the degree. Such duplication may result in the withdrawal of credit. This policy also applies to Advanced Placement credit.

Certain courses (e.g., ensemble, performance instruction, special topics, and directed study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester should not exceed 3 credit hours without permission.

### **Normal Course Load**

Each semester, regular tuition is charged on the basis of a normal course load of 12 to 18 semester hours. No more than 18 or fewer than 12 hours may be taken in any one semester without authorization from the dean of Peabody Student Affairs. There is an extra charge for more than 18 hours at the current hourly rate (contact Student Accounts). Students permitted to take fewer than 12 hours are either placed on academic probation or issued an academic warning, unless their light load is necessary because of health, family or outside employment. The one exception to this policy is that seniors who have fewer than 12 hours required for the completion of their degree, beyond the hours associated with the HOD internship or student teaching if they are to be taken in the final semester, can take fewer than 12 hours in one of their last two semesters (e.g., a semester in which an internship or student teaching is not being taken) without penalty or requiring special permission.

### **Class Standing**

To qualify for sophomore standing, a freshman must earn at least 24 hours with a grade point average of at least 1.800 and have completed two regular semesters. A freshman who fails to achieve sophomore standing at the end of two regular semesters is placed on probation and has one additional semester in which to qualify for sophomore standing. This additional semester must be the summer session at Vanderbilt. Normally, students who fail to qualify for sophomore standing in the third semester are dropped from the university.

A student qualifies for junior standing by earning 54 hours with a grade point average of at least 1.900 and having completed four regular semesters. Students who fail to qualify for junior standing at the end of two semesters after qualifying for sophomore standing are placed on probation and must qualify in an additional semester. This third semester must be the summer session at Vanderbilt. Normally, students who do not qualify for junior standing in this additional semester will be dropped from the university.

A student qualifies for senior standing by earning 84 hours with a grade point average of at least 2.000 and having completed six regular semesters. A student who fails to qualify for senior standing within two semesters of qualifying for junior standing will be placed on probation and must qualify in one additional semester. This additional semester must be the summer session at Vanderbilt. Normally, students who do not qualify for senior standing in this additional semester will be dropped from the university.

### **Alternate Track**

Occasionally students find that it will be necessary to reduce their normal load due to medical reasons, varsity athletics, or other circumstances. The result is that they will accomplish the bachelor of science degree in nine or ten semesters instead of eight. In such cases, the student may request Alternate Track status. After discussing this option with their parents and faculty adviser, students petition the dean for permission. This normally takes place during the sophomore year. Additional information is available in the Office of Peabody Student Affairs.

### **Progress Evaluation**

Students enrolled in Peabody College are expected to satisfy most Liberal Education Core requirements during the freshman and sophomore years. Although legitimate circumstances sometimes force the postponement of Liberal Education Core requirements, upper-level students are not expected to have a significant number of Liberal Education Core requirements outstanding. A student who, in the opinion of the faculty adviser, the department chair, or the dean, is not making satisfactory progress toward meeting Liberal Education Core or other degree requirements may be reported to the Undergraduate Administrative Committee and is subject to being placed on academic probation by that committee. Students placed on academic probation for failure to make satisfactory progress toward a degree must remove the deficiency in the manner specified by the Administrative Committee.

### **Academic Probation and Dismissal**

After achieving sophomore standing, the student may not be on academic probation for more than two semesters. A student whose academic record warrants a third semester

of probation normally will be dropped from the university. Students will be placed on academic probation, or may receive an academic warning, if any of the following conditions apply:

### *Freshmen*

1. The student's cumulative grade point average falls below 1.800. Probation is removed (assuming there is no other reason for the probation) when the student's grade point average is raised to 1.800 or above.
2. The student fails to earn at least 12 hours in a regular semester as a freshman. Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress.
3. The student fails to achieve sophomore standing in the required two semesters. Probation is removed when the student achieves sophomore standing.
4. Freshmen who pass fewer than two regular courses in their first regular semester or who earn a grade point average lower than 1.000 have so seriously compromised their academic standing that they may be required to take an academic probationary leave of absence during the spring semester.

### *Sophomores*

1. The student's cumulative grade point average falls below 1.800. Probation is removed (assuming there is no other reason for the probation) when the student's grade point average is raised to 1.800 or above, except that at the end of the second regular semester the student must qualify for junior standing.
2. The student fails to earn at least 12 hours in a regular semester as a sophomore. Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress.
3. The student is placed on probation by the Undergraduate Administrative Committee for failure to make satisfactory progress toward the degree. Probation is removed when the specified conditions are met.
4. The student fails to achieve junior standing in the required two semesters after achieving sophomore standing. Probation is removed when junior standing is achieved.

### *Juniors*

1. The student's cumulative grade point average falls below 1.900. Probation is removed (assuming there is no other reason for the probation) when the grade point average is raised to 1.900 or above, except that at the end of the second regular semester the student must qualify for senior standing.
2. The student fails to earn at least 12 hours in a regular semester as a junior. Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress.
3. The student is placed on probation by the Undergraduate Administrative Committee for failure to make satisfactory progress toward the degree. Probation is removed when the specified conditions are met.

4. The student fails to achieve senior standing in the required two semesters after achieving junior standing. Probation is removed when senior standing is achieved.

### *Seniors*

1. The student's cumulative grade point average falls below 2.000. Probation is removed when the grade point average is raised to 2.000 or above.
2. The student fails to earn at least 12 hours in a regular semester as a senior, unless the semester is one in which the student needs fewer than 12 hours in order to complete the requirements for graduation (see section on Course Load, above). Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress and/or completes the requirements for graduation.

### *Sudden Academic Insufficiency*

Any student who fails by a wide margin to reach prescribed levels of academic achievement, either at the end of a semester or at mid-semester, or who has been placed on probation more than once is reviewed by the Peabody Undergraduate Administrative Committee. The Committee considers each case within the general guidelines for maintenance of satisfactory academic standing and may take any of several actions, among which are the following:

- The student may be placed on probation or be issued an academic warning;
- The student may be advised to take a leave of absence or to withdraw from the university;
- The student may be required to take an academic probationary leave of absence.
- The student may be dismissed from the university.

Under certain circumstances, a student who has been formally dismissed may be readmitted to Peabody. The Peabody Undergraduate Administrative Committee must review and approve any request for readmission.

### **Appeal and Petition Process for Undergraduate Academic Matters**

The procedures of the appeal process pertaining to academic matters within Peabody College are listed below. Please see the chapter "Student Accountability" in the Vanderbilt University *Student Handbook* for a description of the appeal process for non-academic matters.

Petitions for exceptions to academic policies, appeals of academic policy implementations by Peabody Dean's Office staff, and appeals of academic actions by the Undergraduate Administrative Committee (UAC) Chair (e.g., letters of dismissal) may be directed to the full UAC.

Petitions and appeals should be sent to:

Chair, Peabody Undergraduate Administrative Committee  
 c/o Peabody Dean's Office  
 202 Peabody Administration Building  
 PMB 0329  
 230 Appleton Place  
 Nashville, TN 37203-5721  
 Fax: (615) 322-8501

A student may ask the UAC to reconsider a decision if the student has new information to offer. The chair of the UAC will decide whether the full UAC will reconsider. Requests for reconsideration of UAC decisions should be sent to the above address.

A final, negative decision of the UAC may be appealed to the dean of Peabody College (at the above address), who may assign an associate dean to handle the matter on the dean's behalf. The dean or associate dean will consult with the UAC and other relevant faculty or staff as part of the review of the decision.

Further appeals beyond Peabody College should be directed to the Provost's Office.

### **Student Leave of Absence**

A student desiring a leave of absence should obtain the appropriate forms from the Office of Undergraduate Student Affairs. All students are eligible, provided they have not been dropped by the university and are not dropped at the end of the semester during which application is made.

Leaves are granted for one or two semesters. Applications should be completed before the end of the fall semester for a leave of absence during the spring semester and before 15 August for a leave of absence during the fall semester (or for the academic year). If the leave is approved, the student must keep the Dean's Office informed of any change of address while on leave.

Should a student seek to transfer to Vanderbilt credit earned elsewhere while on a leave of absence, it is mandatory that permission be obtained in advance from the Dean's Office. Petitions for leaves of this type must be filed at least one month before the close of the preceding semester.

While the student is on leave, registration information will be emailed to his or her Vanderbilt email address. A student failing to register at the conclusion of the stated leave will be withdrawn from the university and must apply for readmission.

Students who wish to participate in a non-Vanderbilt program in the United States, abroad, or at sea should apply for a leave of absence for the relevant semester. To qualify for such a leave, a student must be in good standing at Vanderbilt with at least a 2.700 grade point average as of the date of application. Students must obtain prior approval for the leave of absence and for the credits to be taken in other programs if the credits are to be transferred to Vanderbilt. Final approval of leaves of absence always rests with the Dean's Office. See the section on Transfer Credit in this chapter.

### **Withdrawal from the University**

Students proposing to withdraw from the university during any semester must report to the Peabody Office of Undergraduate Student Affairs to initiate proper clearance procedures. Students are graded on the same basis as if withdrawing from a course. Students who withdraw before the end of the eighth week of classes receive a partial refund of tuition (see the section on Financial Information). Students intending to withdraw from the university for the following semester should notify the Peabody Office of Undergraduate Student Affairs by 1 December for spring semester or by 1 May for the fall semester.

Students who have withdrawn from the university without filing a Leave of Absence form must apply for readmission if they wish to return.

### **Graduation**

Degree candidates must have completed satisfactorily all curriculum requirements, have passed all prescribed examinations, and be free of indebtedness to the university. Graduation requirements vary with the student's program of study but include a minimum of 120 hours (at least 60 of which must have been earned at Vanderbilt) and a minimum cumulative grade point average of 2.000. A degree candidate must also have a 2.0 cumulative grade point average in his or her major.

*Commencement.* The university holds its annual Commencement ceremony following the spring semester. A student completing degree requirements will be officially graduated, however, at the close of the semester or summer session in which the degree is earned, with such graduation recorded on the student's permanent record. Students who graduate at the close of the summer session or the fall semester preceding the spring commencement ceremony are encouraged to join spring graduates in the graduation ceremony in May. Those unable to do so may receive their diplomas by mail.

# Special Programs

## Peabody Scholars Program

Students entering Peabody College with outstanding academic records and freshmen who achieve academic distinction during their first semester at Vanderbilt are invited to participate in the Peabody Scholars Program. All freshman Peabody Scholars participate in a three-credit-hour seminar during the spring semester. In the sophomore year, Scholars enroll (spring semester) in an honors seminar for one credit hour that examines faculty-led research projects across the college. Peabody Scholars are offered a summer stipend (between sophomore and junior years) to support research, overseas study, or a community service project. In the junior year, Scholars engage in an independent research project with a Peabody professor. The Senior Capstone involves participation in university-wide scholarly and cultural events. In sum, the Peabody Scholars Program offers a rich array of intellectual opportunities and academic experiences.

Peabody freshmen may apply for the Scholars Program in early December of their first semester at Vanderbilt. Selections will be made prior to the beginning of the spring semester. To remain in good standing in the program, students must maintain a minimum grade point average of 3.0. Further information on the Peabody Scholars Program may be obtained from Professor Leslie Kirby in the Department of Human and Organizational Development.

## Post-Baccalaureate Program with School of Nursing

Students at Peabody College may complete the B.S. degree with a major in human and organizational development or child development and also earn the master of science in nursing (M.S.N.) through a senior-in-absentia program in the School of Nursing. Students must complete the first three years of study as Peabody undergraduate students. During this time students pursue the major and the core courses in the health and human services track. Application for admission to the School of Nursing is completed by November 1 of the student's junior year. Admitted students begin taking professional nursing courses in the fall of their senior year. Students must have successfully completed a minimum of 91 hours of undergraduate course work and all human and organizational development major and Liberal Education Core requirements before officially being enrolled as students in the School of Nursing. Upon successful completion of a minimum of 31 hours of nursing course work during the senior year, students are awarded the B.S. degree. Students continue full time in the professional program in the School of Nursing for the next summer, fall, spring, and summer sessions to earn the M.S.N. degree. Students who receive the M.S.N. degree are qualified for all professional nursing careers and are eligible to apply to the National Council on Licensure Examination to become Registered Nurses.

A sample curriculum is given below.



## Sample Curriculum Plan

### *Human and Organizational Development Major/Nursing*

		Semester hours	
		FALL	SPRING
FRESHMAN YEAR			
<b>HOD 1250</b>	Applied Human Development	3	-
<b>HOD 1251</b>	Intrapersonal Development	1	-
<b>HOD 1300</b>	Small Group Behavior	-	3
<b>HOD 1301</b>	Interpersonal Development	-	1
<b>Math</b>	Mathematics Course	3	-
	Statistics Course	-	3
<b>Philosophy</b>	Philosophy Course	-	3
	Liberal Education Core	6	6
<b>Psychology 1250</b>	Developmental Psychology	3	-
		16	16
		Semester hours	

SOPHOMORE YEAR		FALL	SPRING
<b>HOD 2100</b>	Understanding Organizations	3	-
<b>HOD 2400</b>	Talent Management and Organizational Fit	-	3
<b>HOD 2500</b>	Systematic Inquiry I	3	-
<b>Econ 1010</b>	Economics	3	-
<b>HOD 2700</b>	Public Policy	-	3
<b>NURS 1500</b>	Introduction to Microbiology	-	4
	Liberal Education Core	6	6
		15	16
JUNIOR YEAR*			
<b>HOD Courses</b>	HOD Health and Human Services Track Required Courses	3	6
<b>HOD Courses</b>	HOD Track Electives	3	3
<b>NURS 3101</b>	Human Anatomy and Physiology	4	-
<b>NURS 3102</b>	Human Anatomy and Physiology	-	4
<b>NURS 1601</b>	Introduction to Nutrition	2	-
	Liberal Education Core	3	3
		15	16

\*Students apply for admission to the School of Nursing during the fall semester of their junior year.

#### SENIOR YEAR

		Hours
FALL SEMESTER		
<b>NURS 5101</b>	Legal and Ethical Accountability in Professional Nursing Practice	2
<b>NURS 5102</b>	Principles of Client-Centered Care	1
<b>NURS 5105</b>	Enhancement of Community and Population Health I	2
<b>NURS 5103</b>	Human Experience of Health and Illness Across the Lifespan I	4
<b>NURS 5115</b>	Fundamentals of Clinical Practice*	5
<b>NURS 5106</b>	Pharmacology for Nursing Care I	2
		16
SPRING SEMESTER		
<b>NURS 5201</b>	Inquiry and Evidence in Professional Nursing Practice	2
<b>NURS 5205</b>	Enhancement of Community and Population Health II	3
<b>NURS 5203</b>	Human Experience of Health and Illness Across the Lifespan II	5
<b>NURS 5215</b>	Integration of Theoretical and Clinical Aspects of Nursing I*	3
<b>NURS 5206</b>	Pharmacology for Nursing Care II	2
		15

\*Acceptable as undergraduate Human and Organizational Development internship requirement.

B.S. in human and organizational development conferred at the end of the spring semester. Refer to the *School of Nursing Catalog* for requirements for completion of the M.S.N.

# Interdisciplinary Majors

**P**EABODY College, in conjunction with the College of Arts and Science, offers four interdisciplinary majors. These majors are to be taken as second majors only and are constructed around academic disciplines particularly appropriate for future teachers (except secondary), but are not limited to students entering teacher education. The interdisciplinary major consists of 36 hours of study and draws upon the academic resources of a number of departments throughout the University. Students follow the Liberal Education Core requirements of their first major.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

## Language and Literacy Studies (36 hours)

### COMMUNICATIONS.

6 hours from:

CMST 1500, Fundamentals of Public Speaking; CMST 1850 Interpersonal Communications

### ENGLISH.

9 hours from:

ENGL1230W, 1270W or 1260W and 1250W and 3210 and above

### EDUCATION.

9 hours from:

ENED 2100, 2200 or 4963 (3 hours); ENED 2430, ENED 3310 (3 hours); SPED 2430 or PSY-PC 3150 (3 hours)

### ADDITIONAL COURSES

12 hours from two areas:

ANTH 1601, Introduction to Language and Culture; ANTH 2601, Introduction to Linguistics; ANTH 2602, Anthropological Linguistics; ANTH 2603 Comparative Writing Systems; CMST 2800, Rhetoric of Civic Life; CMST 3000, Rhetoric of American Experience, 1640-1865; CMST 3001, Rhetoric of American Experience, 1865-1945; CMST 2900, Values of Modern Communication; CMST 3002, Rhetoric of the American Experience 1945-Present; CMST 2950, Rhetoric of Mass Media; PHIL1003, General Logic; PSCI 2242, Political Communication; THTR 1010, Fundamentals of Theatre

## Mathematics and Science Studies (35–37 hours)

### BIOLOGICAL SCIENCES.

4 hours from:

BSCI 1100 and 1100L, Biology Today; BSCI 1105, Human Biology; BSCI 1510 and 1510L, or BSCI 1511 and 1511L, Introduction to Biological Sciences; BSCI 1103, Green Earth, the Biodiversity and Evolution of Green Plants

### CHEMISTRY.

4 hours from:

CHEM1010L and 1010, or CHEM 1020L and 1020, Introductory Chemistry; CHEM 1601 and 1601L, or CHEM 1602 and 1602L, General Chemistry

### PHYSICS.

4 hours from:

PHYS 1010 and 1010L, Introductory Physics; PHYS 1601 and 1601L or 1602 and 1602L, General Physics

### EARTH AND SPACE SCIENCES.

3-4 hours from:

ASTR 1010 and 1010L, Introductory Astronomy: Stars and Galaxies; EES 1510 and 1510L, The Dynamic Earth; EES 1030 and 1030L, Oceanography; EES 1080, Earth and Atmosphere; EES 1140, Ecology, Evolution, and Climate through Time

### HISTORY/ PHILOSOPHY OF SCIENCE.

3 hours from:

ASTR 2130, Theories of the Universe; HIST 2800, Modern Medicine; PHIL 3616, Philosophy and the Natural Sciences

### CALCULUS.

8-9 hours from:

MATH 1200, 1201, and 2200, Single-Variable Calculus I, II, and III; MATH 1300 and 1301, Accelerated Single-Variable Calculus I and II

### PROBABILITY AND STATISTICS.

3 hours from:

MATH 2820 Introduction to Probability and Mathematics Statistics; MATH 3700, Discrete Mathematics; PSY-PC 2110 Introduction to Statistical Analysis

### GEOMETRY.

3 hours from:

MATH 3200, Introduction to Topology; MATH 3210, Transformation Geometry; MATH 3310, Introduction to Mathematical Logic

### ALGEBRA

3 hours from:

MATH 2410, Methods of Linear Algebra; MATH 2600, Linear Algebra; MATH 3300, Abstract Algebra

## Natural Science Studies (35–36 hours)

### BIOLOGICAL SCIENCES.

8 hours from:

BSCI 1100/1100L, Biology Today; BSCI 1105, Human Biology; BSCI 1510 and 1510L, and/or 1151 and 1151L, Introduction to Biological Sciences; BSCI 1103, Green Earth, the Biodiversity and Evolution of Green Plants

### CHEMISTRY.

8 hours from:

CHEM 1010L and 1010 and/or 1020L/1020, Introductory Chemistry; CHEM 1601 and 1601L and/or 1602 and 1602L, General Chemistry

### PHYSICS.

4 hours from:

PHYS 1010 and 1010L, Introductory Physics; PHYS 1601/1601L or 1602 and 1602L, General Physics

### EARTH AND SPACE SCIENCES.

3-4 hours from:

ASTR 1010/1010L Introductory Astronomy: Stars and Galaxies; EES 1510 and 1510L, The Dynamic Earth; EES 1030 and 1030L, Oceanography; EES 1080 Earth and Atmosphere; EES 1140, Ecology, Evolution, and Climate through Time

### HISTORY/ PHILOSOPHY OF SCIENCE.

3 hours from:

ASTR 2130, Theories of the Universe; HIST 2800, Modern Medicine; PHIL 3613, Philosophy and the Natural Sciences

### ELECTIVES.

9 hours (3 additional courses) in:

Astronomy, Biological Sciences, Chemistry, Earth and Environmental Sciences, Physics, or History and Philosophy

## Second Language Studies (36 hours)

### EDUCATION.

9 hours from:

EDUC 3730, ELL Educational Foundations; EDUC 3750, Linguistics and Language Acquisition for ELL Teachers; ENGL 1260W, Introduction to Literary and Cultural Analysis

### PSYCHOLOGY.

3 hours from:

PSY-PC 1250, Developmental Psychology; PSY-PC 2600, Educational Psychology

### LINGUISTICS.

3 hours from:

ANTH 1101, Introduction to Linguistics; ENED 2430, Fostering Language in Diverse Classrooms; SPED 2430, Introduction to Language and Communication

### FOREIGN LANGUAGE.

9 hours of language courses from:

Arabic, Chinese, French, German, Hebrew, Italian, Japanese, Portuguese, Russian, or Spanish

### ELECTIVES.

6 hours of elective courses are to be selected to reflect a concentration within a specific foreign language. Students MUST consult with their advisers when selecting elective hours.

For elementary or early childhood majors seeking an added endorsement in ELL, in addition to the above major requirements, the following 9 hours are required: EDUC 3740, ELL Methods and Materials (3 hours); EDUC 3760, Assessment of ELL (3 hours); EDUC 3731, 3742, and 3763, Practicum for ELL (3 hours)

## Social Studies (36 hours)

Students selecting an interdisciplinary major in social studies will have seven options available to them. Each option requires 18 hours of study focused on a single social science discipline that is supplemented with 18 hours of course work drawn from studies within other social sciences. The seven options available to students include a focus on any of the following areas of study: Anthropology, Economics, American History, European History, American Politics, World Politics, or Sociology.

### *Anthropology*

9 hours from:

ANTH 1101, Introduction to Anthropology; ANTH 1201 Introduction to Archaeology; ANTH 1301, Introduction to Biological Anthropology

9 hours in specified courses:

A Comparative Anthropology and Anthropological Theory Course (3 hours)

An Archaeology and Physical Anthropology Course (3 hours)

An Ethnography, Ethnohistory, and Linguistics Course (3 hours)

Six courses (18 hours) drawn from at least three areas: Economics, History, Political Science, and Sociology

### *Economics*

9 hours required from:

ECON 1010, Principles of Macroeconomics; ECON 1020, Principles of Microeconomics; ECON1500, Economic Statistics

Additional 9 hours in Economics Courses

Six courses (18 hours) drawn from at least three areas: Anthropology, History, Political Science, and Sociology

### *United States History*

6 hours from:

HIST 1390, America to 1776; HIST 1400, U.S. 1776-1877; HIST 1410, U.S. 1877-1945; HIST 1420, U.S. Post-1945

Additional four courses (12 hours) of United States History courses from: HIST 1390-1440, 1660, 1690, 1720, 1730, 2580, 2590, 2610-2650, 2690-2722

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, Political Science, and Sociology

### *European History*

6 hours from:

HIST 1350, History of Western Civilization to 1700; HIST 1360, History of Western Civilization since 1700

Additional four courses on European History from:

HIST 1600, 2130 2135, 2220-2410

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, Political Science, and Sociology

### *American Politics*

3 hours from:

PSCI 1100, Intro. to American Government and Politics

Any five (15 hours) of the following PSCI courses: 2204, 2222, 2240-2246, 2248, 2251, 2255, 2256, 2259, 2262, 3247, 3249, 3250, 3252-3254, 3258, 3260, 4275

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, History, and Sociology

### *World Politics*

3 hours from:

PSCI 1101, Introduction to Comparative Politics; PSCI 1102, Introduction to International Politics

Any five (15 hours) of the following PSCI courses: 2210, 2212-2216, 2218-2227, 2230-2234, 2236, 3211, 3217, 3228, 3229, 3235

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, History, Sociology

### *Sociology*

6 hours from:

SOC 1010, Introduction to Sociology, or SOC 1020, Contemporary Social Problems (3 hours); SOC 3001, Sociological Perspectives (3 hours)

4 courses (12 hours) 3 hours from each of the following areas:

A sociology course drawn from the core area of Crime, Law, and Deviance

A sociology course drawn from the core area of Organizations, Politics, and Inequality

A sociology course drawn from the core area of Family, Medicine, and Mental Health

A sociology course drawn from the core area of Culture and Social Change

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, History, and Political Science



# Majors in Child Development, Child Studies, and Cognitive Studies

CHAIR, DEPARTMENT OF PSYCHOLOGY AND HUMAN DEVELOPMENT  
Amy Needham

DIRECTOR OF UNDERGRADUATE STUDIES Leigh Wadsworth  
PROFESSORS EMERITI Leonard Bickman, David S. Cordray, Kathleen  
V. Hoover-Dempsey, Howard M. Sandler, James H. Steiger

PROFESSORS David A. Cole, Bruce E. Compas, Elizabeth Dykens,  
Dale C. Farran, Judy Garber, Daniel T. Levin, David Lubinski, Amy  
Needham, John J. Reiser, Joseph Lee Rodgers III, Tedra Ann Walden

ASSOCIATE PROFESSORS Laura R. Novick, Kristopher Preacher,  
Bethany Rittle-Johnson, Deborah W. Rowe, Megan M. Saylor, Craig  
A. Smith, Georgene Troseth, Bahr Weiss

ASSOCIATE CLINICAL PROFESSOR Francis Joseph McLaughlin III

ASSISTANT PROFESSORS Sun-Joo Cho, Lisa K. Fazio, Jonathan Lane,  
Gavin Price, Sonya Sterba

ASSISTANT CLINICAL PROFESSOR Vicki S. Harris

ASSISTANT PROFESSORS OF THE PRACTICE Allison Bender, Susan  
Douglas, Michelle M. Reising

SENIOR LECTURERS Chase Lesane-Brown, Julia Noland, Leigh  
Wadsworth

LECTURER Shane Hutton

## Major in Child Development

THE child development major is designed for students who wish to study children (infancy through adolescence) and the family, cultural, peer, school, and neighborhood contexts in which they live. The major is designed to provide a strong background in the social and behavioral sciences related to child development, a focused understanding of the scientific study of children and the contexts in which they develop, and opportunities for supervised and independent research on aspects of child development in ways that enable students to link theories and prior research to research design and data on children's development. The major is excellent preparation for graduate study in selected social science and professional fields (e.g., psychology, medicine, nursing, education, public policy) and offers an excellent complementary (or second) major for undergraduate students simultaneously pursuing a major in cognitive studies, elementary education, human and organizational development, or special education.

The child development curriculum is designed to ensure that students develop a background in the liberal arts and sciences; a clear understanding of the theories, major research findings, and research methods central to the field of child development; and an area of focus or expertise in child development. Development of background in the liberal arts and sciences occurs within the context of the Liberal Education Core, composed of required and elective courses in communications, humanities, mathematics, natural sciences, and social sciences. A clear understanding of theory and research central to the field is developed through the major core courses. These include an overview of child development, courses focused on the domains of psychological processes central to human development (cognition; social and personality development), courses related to major epochs of child development (infancy and adolescence), and courses devoted to the major research methodologies in the field (experimental, observational, psychometric). Students select an area of concentration (major elective area) to complement the field as a whole.

## Honors Program

The Honors Program in child development offers qualified majors the opportunity to conduct individual research projects in collaboration with faculty members. This research experience culminates in the writing and public presentation of a senior thesis. Students who major in child development are eligible to apply for the Honors Program at the end of their sophomore year if they have an overall grade point average of at least 3.2 and at least a 3.2 in child development courses.

Students who complete the program successfully and who have a final grade point average of at least 3.2 will receive Honors or Highest Honors in child development. The program should substantially aid those intending to do graduate work. More specific information concerning admission to and the requirements of the Honors Program is available from the director of the Honors Program, the director of undergraduate studies, or the department education coordinator.

## Curriculum

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students take a minimum of 120 hours, distributed as follows:

### *Liberal Education Core Requirements. Minimum 40 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

### *Major Requirements. 30 hours.*

Students take a minimum of 30 hours in child development. The core consists of seven courses (21 hours) in developmental areas, epochs, and methods, and a minimum of three additional courses (9 hours) in an elective area of specialization.

**Major Core. 21 hours.**

PSY-PC 1250. Developmental Psychology  
 PSY-PC 2250. Cognitive Aspects of Human Development  
 PSY-PC 2400. Social and Personality Development  
 PSY-PC 2120. Statistical Analysis

One of the following two courses:

PSY-PC 2500. Infancy  
 PSY-PC 2550. Adolescent Development

Two of the following courses:

PSY-PC 2170. Experimental Methods, or  
 Psy 2150. Principles of Experimental Design  
 PSY-PC 3722. Psychometric Methods  
 PSY-PC 3860, 3980, 3981, 4998, 4999; Psy 3840, 3980, 4998, 4999.  
 Directed Research or Honors Research (Only 3 hours of either Directed  
 Research or Honors Research can be applied to this requirement.)

**Major Elective Area. A minimum of 9 hours.**

Any course in the Department of Psychology and Human Development (Peabody) or the Department of Psychology (A&S) that is not being used to meet another psychology requirement can be used as an elective (except, Psy 1200, Psy 2100, PSY-PC 1205/1207, 2110, 3870).

Additionally, the following courses may serve as electives. With the approval of the adviser, program director, or director of undergraduate studies, other courses may also be used as part of the child development elective area.

Education 3120. Children in Families and Schools  
 Education 3140. Learning and Development in Early Childhood Education  
 English Education 2430. Fostering Language in Classrooms  
 English Education 2100. Literature and Drama for Young Children  
 English Education 2200. Exploring Literature for Children  
 HODC 3232. Ethics for Human Development Professionals  
 HODC 3342. Introduction to Community Psychology  
 Neuroscience 2201. Neuroscience  
 Neuroscience 3269. Developmental Neuroscience  
 Philosophy 3617. Philosophy of Language  
 PSY-PC 3850.\* Independent Study  
 PSY-PC 3860.\* Directed Research  
 PSY-PC 3980 or Psychology 3980, 3981, 4998, 4999\* Honors Research  
 SPED 2120. Family Interventions  
 SPED 2160. Cultural Diversity in American Education  
 SPEDH 3348. Language and Learning  
 SPEDS 2430. Introduction to Language and Communication

NOTE: Research/experiential courses marked \* above may be repeated freely for elective credit toward graduation. However, only a total of 6 hours from among these courses, in any combination, may be used as elective credit within the major.

**Second Major or Electives. 50 hours (or less if additional hours are earned in the Liberal Education Core, Major Core, or Major Elective Area).**

**The Five-year Child Development/Nursing Program**

The Five-year Child Development/Nursing program combines the undergraduate major degree in child development with the requirements of the Master of Science in Nursing program in the School of Nursing. The prerequisites for admission to the Five-year Child Development/Nursing program are completed within the first three years of the undergraduate program; these include all requirements of the child development major and all prerequisites for admission to the Master of Science in Nursing (M.S.N.) program. Application to the M.S.N. program in the School of Nursing is made by December of the junior year, and admissions decisions are made during the spring that follows. If admitted to the program, the student takes all senior year courses in the School of Nursing. The bachelor of science degree in child development is awarded after the completion of the senior year (and a minimum of 120 credit hours). The student continues in the Nursing program during the summer immediately following graduation and continues through the fifth year as a student in the School of Nursing. The master of science in nursing is awarded upon completion of all Nursing program requirements, usually at the end of the fifth year of study.

*Sample Curriculum Plan: Child Development Major/Nursing*

		Semester hours	
		FALL	SPRING
FRESHMAN YEAR	30 hours		
<b>PSY-PC 1250</b>	Developmental Psychology	3	-
<b>PSY-PC 2250</b>	Cognitive Aspects of Human Development	-	3
<b>PSY-PC 2400</b>	Social and Personality Development	-	3
	Liberal Education Core	12	9
		<u>15</u>	<u>15</u>
SOPHOMORE YEAR	32 hours		
<b>PSY-PC 2110</b>	Statistics*, <b>or</b>	3	-
<b>Psy 2100</b>			
<b>PSY-PC 2120</b>	Statistics	-	3
<b>NURS 1500</b>	Introduction to Microbiology**	-	4
One of the following:		3	-
<b>PSY-PC 2500</b>	Infancy		
<b>PSY-PC 2550</b>	Adolescent Development		
One of the following:		-	3
<b>PSY-PC 2170</b>	Experimental Methods		
<b>PSY-PC 3722</b>	Psychometric Methods		
<b>PSY-PC 3860</b>	Directed Research		
	Liberal Education Core	10	6
		<u>16</u>	<u>16</u>

**Application to the Nursing program: Middle of the junior year**

JUNIOR YEAR	31 hours		
<b>NURS 3101</b>	Anatomy and Physiology I**	4	-
<b>NURS 3102</b>	Anatomy and Physiology II**	-	4
<b>NURS 1601</b>	Nutrition	-	2
One of the following:		3	-
<b>PSY-PC 2170</b>	Experimental Methods		
<b>PSY-PC 3722</b>	Psychometric Methods		
<b>PSY-PC 3860</b>	Directed Research		
	Child Development major elective area	6	3
	Liberal Education Core/Electives	3	6
		<u>16</u>	<u>15</u>

\*Child development major prerequisite and meets Liberal Education Core requirement.

\*\*Meets Five-year Nursing Program requirement and Liberal Education Core requirement.

*Pre-Specialty Five-year Curriculum**Sample Curriculum Plan (Continued)***Required Nursing Courses (31 hours):****(Senior Year taken while enrolled in the School of Nursing—Admission Required)**

## FALL

<b>NURS 5101</b>	Legal and Ethical Accountability in Professional Nursing Practice [2]
<b>NURS 5102</b>	Principles of Client-Centered Care [1]
<b>NURS 5105</b>	Enhancement of Community and Population Health I [2]
<b>NURS 5103</b>	Human Experience of Health and Illness Across the Lifespan I [4]
<b>NURS 5115</b>	Fundamentals of Clinical Practice [5]
<b>NURS 5106</b>	Pharmacology for Nursing Care I [2]

## SPRING

<b>NURS 5201</b>	Inquiry and Evidence in Professional Nursing Practice [2]
<b>NURS 5205</b>	Enhancement of Community and Population Health II [3]
<b>NURS 5203</b>	Human Experience of Health and Illness Across the Lifespan II [5]
<b>NURS 5215</b>	Integration of Theoretical and Clinical Aspects of Nursing I [3]
<b>NURS 5206</b>	Pharmacology for Nursing Care II [2]

## FIFTH YEAR IN PRE-SPECIALTY

Refer to the *School of Nursing Catalog* for requirements for completion of the M.S.N. degree.

## Major in Child Studies

PEABODY has long had great strength in the area of child studies. The 36-hour interdisciplinary major in child studies draws on courses from psychology, education, special education, and human and organizational development. The major is excellent pre-professional preparation for students interested in graduate school in psychology or education, in law (e.g., child and family advocacy), or in various health related areas (e.g., medicine, nursing) involving children. It is also appropriate for students who are interested in gaining a broader understanding of children and families in contemporary society. The major areas covered are: developmental psychology; learning; research methods; language and literacy; and families, community, and diversity.

### Honors Program

The Honors Program in child studies offers qualified majors the opportunity to conduct individual research projects in collaboration with faculty members. This research experience culminates in the writing and public presentation of a senior thesis. Students who major in child studies are eligible to apply for the Honors Program at the end of their sophomore year if they have an overall grade point average of at least 3.2 and a 3.2 in child studies courses. Students who complete the program successfully and who have a final grade point average of at least 3.2 will receive Honors or Highest Honors in child studies. The program should substantially aid those intending to do graduate work. More specific information concerning admission to and the requirements of the Honors Program is available from the director of the Honors Program, the director of undergraduate studies, or the department education coordinator.

### Curriculum

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students take a minimum of 120 hours, distributed as follows:

#### *Liberal Education Core Requirements. Minimum 40 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

#### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

## Child Studies Major Courses

### DEVELOPMENT COURSES. (9 hours)

- PSY-PC 1250. Developmental Psychology
- PSY-PC 2250. Cognitive Aspects of Human Development
- PSY-PC 2400. Social and Personality Development
- PSY-PC 2500. Infancy
- PSY-PC 2550. Adolescent Development

### LEARNING. (3 hours)

- Mathematics Education 2100 or 2200
- Science Education 2200 or Social Studies Education 2100
- PSY-PC 2600. Educational Psychology
- SPED 2310. Managing Academic and Social Behavior

### RESEARCH METHODS. (3 hours)

- PSY-PC 2170. Experimental Methods, or  
Psy 2150. Principles of Experimental Design
- PSY-PC 3722. Psychometric Methods
- PSY-PC 3724. Psychometrics
- HOD 2500. Systematic Inquiry

### FAMILIES, COMMUNITY, AND DIVERSITY. (6 hours)

- EDUC 1220. Society, School, and the Teacher
- EDUC/SPED 2160. Cultural Diversity in American Education
- EDUC 3120. Children in Families and Schools
- EDUC 3620. Social and Philosophical Aspects of Education
- HODH 3221. Health Service Delivery to Diverse Populations
- HODC 3202. Social Problems I
- HODC 3342. Introduction to Community Psychology
- SPED 1210. Introduction to Exceptionality
- SPED 2120. Family Intervention

### LANGUAGE AND LITERACY. (6 hours)

- ANTH 2601. Introduction to Linguistics
- EDUC 3114. Language and Literacy Learning in Young Children
- EDUC 3214. Theory and Method of Reading Instruction in Elementary Schools
- ENED 2430. Fostering Language in Classrooms
- ENED 2100. Literature and Drama for Young Children
- ENED 2200. Exploring Literature for Children
- Philosophy 3617. Philosophy of Language
- PSY-PC 3150. Language Development
- SPEDS 2430. Introduction to Language and Communication
- SPEDH 3348. Language and Learning

### ELECTIVES IN CHILD STUDIES. (9 hours)

Any course in the Department of Psychology and Human Development (Peabody) or the Department of Psychology (A&S) that is not being used to meet another psychology requirement can be used as an elective (except PSY 1200, Psy 2100, PSY-PC 1205/1207, 2110, and 3870).

Additionally, the following courses may serve as electives. With the approval of the adviser, program director, or director of undergraduate studies, other courses may also be used as part of the child studies elective area.

- PSY-PC 3850.\* Independent Study
- PSY-PC 3860.\* Readings and Research for Undergraduates
- PSY-PC 3980, 3981, 4998, 4999, or Psy 3980, 3981, 4998, 4999.\*  
Honors Research
- HOD 3232. Ethics for Human Development Professionals
- HODC 3202. Community Development Theory

NOTE: Research/experiential courses marked \* above may be repeated freely for elective credit toward graduation. However, only a total of 6 hours from among these courses, in any combination, may be used as elective credit within the major.

## Major in Cognitive Studies

THE cognitive studies major is designed for students who wish to become active inquirers into the processes by which people learn to think, solve problems, and reason. The major encourages the development of flexible reasoning and problem-solving skills that are useful in a wide variety of endeavors. The major is excellent preparation for graduate study in the social and behavioral sciences as well as for areas (such as medicine and law) that place importance on inquiry and clear thinking.

The curriculum is planned to ensure that students receive a strong background in both science and the liberal arts, with an emphasis on problem solving and complex decision making. The courses in the core curriculum focus on various aspects of human cognition, including communication, cognitive development, basic cognitive processes, applications of theories of knowledge, and sociocultural aspects of learning. Students are encouraged to consult their advisers about pursuing a second major or developing an area of concentration that is consistent with their career plans. The major also emphasizes an appreciation of the scientific method and the research process; numerous opportunities exist to pursue independent study in close collaboration with faculty members.

Leadership and success in our society will depend increasingly on one's ability to process complex information, solve difficult problems using systematic analysis, and facilitate the learning of others. The knowledge and experience gained by students in cognitive studies will allow them to be full participants in the society of learners who represent the future.

### Honors Program

The Honors Program in cognitive studies offers qualified majors the opportunity to conduct individual research projects in collaboration with faculty members. This research experience culminates in the writing and public presentation of a senior thesis. Students who major in cognitive studies are eligible to apply for the Honors Program at the end of their sophomore year if they have an overall grade point average of at least 3.2 and a 3.2 in cognitive studies courses. Students who complete the program successfully and who have a final grade point average of at least 3.2 will receive Honors or Highest Honors in cognitive studies. The program should substantially aid those intending to do graduate work. More specific information concerning admission to and the requirements of the Honors Program is available from the director of the Honors Program, the director of undergraduate studies, or the department education coordinator.

### Curriculum

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students take a minimum of 120 hours, distributed as follows:

#### *Liberal Education Core Requirements. Minimum 40 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### Writing Requirement

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

#### *Major Requirements. 33 hours.*

Students take a minimum of 33 hours in Cognitive Studies. The core consists of four courses (12 hours), a minimum five additional courses (15 hours) in the elective area, and two courses (6 hours) in the Methods of Inquiry area.

#### *Major Core. 12 hours.*

PSY-PC 1205. Minds, Brains, Contexts, and Cultures  
or 1207.

PSY-PC 2200. Psychology of Thinking  
or Psy 3120. Cognitive Psychology

PSY-PC 3650. Advanced Topical Seminar

One of the following:

PSY-PC 2170. Experimental Methods or

Psy 2150. Principles of Experimental Design

#### *Major Elective Area. 15 hours*

Any course in the Department of Psychology and Human Development (Peabody) or the Department of Psychology (A&S) that is not being used to meet another psychology requirement can be used as an elective (except PSY-PC 1250, 2110, 3870, Psy 1200, Psy 2100).

Additionally, the following courses may serve as electives. With the approval of the adviser, program director, or director of undergraduate studies, other courses may also be used as part of the cognitive studies elective area.

ANTH 1301. Biological Anthropology

ANTH 2601. Introduction to Linguistics

ENED 2430. Fostering Language in Classrooms

NSC 2201. Neuroscience

PHIL 3617. Philosophy of Language

PHIL 3630. Philosophy of Mind

PSY-PC 3850.\* Independent Study

PSY-PC 3860, Psy 3840.\* Directed Research

PSY-PC 3980, 3981, 4998, 4999, or Psy 3980, 3981, 4998, 4999.\*

Honors Research

SPEDS 2430. Introduction to Language and Communication

NOTE: Research/experiential courses marked \* above may be repeated freely for elective credit toward graduation. However, only a total of 6 hours from among these courses, in any combination, may be used as elective credit within the major.

#### *Methods of Inquiry. 6 hours.*

May also be used to satisfy Liberal Education Core requirements

ANTH 1301, 2211

CHEM 2100

CS 1101 or 2212

EES 3250

HOD 2500

HODC 3222

Philosophy 1003, 3003, 3616

PSY 2100

PSY-PC 2120, 3722, 3724  
 PSY-PC or Psy 3980, 3981, 4998, 4999 (Only 3 hours from any of these courses can be applied to this requirement)  
 SOC 3002  
 SPED 2310  
 SPEDH 3871/SPEDS 3871

*Second Major and Electives. 51-52 hours.*

## Minors

### The Minor in Child Development

The minor in child development consists of 18 hours in the following courses:

PSY-PC 1250. Developmental Psychology  
 PSY-PC 2110. Introduction to Statistical Analysis (may be taken as part of the Liberal Education Core)

One of the following:

PSY-PC 2250. Cognitive Aspects of Human Development  
 PSY-PC 2400. Social and Personality Development

One of the following:

PSY-PC 2500. Infancy  
 PSY-PC 2550. Adolescent Development

One of the following:

PSY-PC 2170. Experimental Methods  
 Psy 2150. Principles of Experimental Design  
 PSY-PC 3722. Psychometric Methods

One child development elective course

(Any of the courses above not taken to meet a minor requirement or any course listed as an elective for the child development major)

### The Minor in Cognitive Studies

The minor in cognitive studies consists of 15 hours in the following courses:

REQUIRED COURSES. (6 hours)

PSY-PC 1205. Minds, Brains, Contexts, and Cultures  
 or PSY-PC 1207.

PSY-PC 2200. Psychology of Thinking  
 or Psy 3120. Cognitive Psychology

ELECTIVE COURSES. (9 hours)

ANTH 2601. Introduction to Linguistics  
 ENED 2430. Fostering Language in the Classroom  
 PSY-PC 1115. First-Year Seminar  
 or PSY-PC 1157.

PSY-PC 2250. Cognitive Aspects of Human Development  
 PSY-PC 2300. Social and Emotional Context of Cognition  
 PSY-PC 2400. Social and Personality Development  
 PSY-PC 3150. Language Development  
 PSY-PC 3650. Advanced Topical Seminar (Intended for students beyond the first year. May be repeated if no duplication of content.)

Psy 3775. Human Memory

Psy 3635. Health Psychology

PSY-PC 3200. Introduction to Clinical Psychology

PSY-PC 3860, 3980, 3981, 4998, 4999. Directed Research/Honors Research (may *not* be repeated for minor credit)

SPEDS 2430. Introduction to Language and Communication

### The Minor in Quantitative Methods

Quantitative skills are highly valued in a variety of fields. Training provided by the quantitative methods minor can

provide a competitive edge on the job market or for future graduate study. Many advances in quantitative methods used in the social sciences and education are not covered in standard undergraduate introductory statistics courses. This minor exposes students to more recent developments in quantitative methods with concrete applications to practice. The quantitative methods minor helps students become better consumers and producers of scientific research. Students will have the opportunity to learn from leading experts in the statistical analysis of social science data.

#### Structure of the Minor

Prerequisite for the minor is completion of the introductory statistics sequence that is already required by the undergraduate psychology majors. This sequence is:

PSY-PC 2110: Introduction to Statistical Analysis (3 hours)  
 or PSY 2100: Quantitative Methods (3 hours)

And

PSY-PC 2120: Statistical Analysis (3 hours)

The quantitative methods minor is an 18-hour minor. The 18 hours include both PSY-PC-2110 (or PSY 2100) and PSY-PC 2120, and these serve as prerequisite courses for the electives. Following completion of these prerequisite courses (6 hours; required), the minor requires four additional courses (12 hours; electives). Any four courses offered by the Quantitative Methods program are applicable. At most, three hours of directed research/independent study can count toward the minor. Students with interest in directed research/independent study can contact individual quantitative methods faculty directly.

Courses that would satisfy the elective requirements (pick 4):

PSY-PC 3722. Psychometric Methods  
 PSY-PC 3724. Psychometrics  
 PSY-PC 3727. Modern Robust Statistical Methods  
 PSY-PC 3730. Applied Latent Class and Mixture Modeling  
 PSY-PC 3732. Latent Growth Curve Modeling  
 PSY-PC 3735. Correlation and Regression  
 PSY-PC 3738. Introduction to Item Response Theory  
 PSY-PC 3743. Factor Analysis  
 PSY-PC 3746. Multivariate Statistics  
 PSY-PC 3749. Applied Nonparametric Statistics

Prior to enrolling in a specific course, please contact the instructor regarding prerequisite courses. Undergraduates may request to be enrolled in QM graduate courses not yet cross-listed as undergraduate courses by using a substitution form, with permission of instructor. We anticipate adding more courses to the list of electives, which will be posted at [peabody.vanderbilt.edu/departments/psych/undergraduate\\_programs/quantitative\\_methods\\_minor.php](http://peabody.vanderbilt.edu/departments/psych/undergraduate_programs/quantitative_methods_minor.php)

For inquiries about the quantitative methods minor, email [kris.preacher@vanderbilt.edu](mailto:kris.preacher@vanderbilt.edu)

# Majors in Early Childhood, Elementary, and Secondary Education

CHAIR, DEPARTMENT OF TEACHING AND LEARNING Rogers Hall  
 DIRECTOR OF UNDERGRADUATE STUDIES Catherine McTamane  
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 ASSISTANT PROFESSORS OF THE PRACTICE Teresa Dunleavy, Andrew Hostetler, Melanie Hundley, Heather L. Johnson, Amy B. Palmeri  
 SENIOR LECTURER Catherine McTamane  
 LECTURERS Steven Baum, Margaret Cagle, Molly Collins, Shannon Daniel, Andrea Henrie, Deborah Lucas-Lehrer, Kristen Neal, Michael Neel, Emily Pendergrass, Jeanne Peter, Rebecca Peterson

## Early Childhood Education

THE major in early childhood education (ECE) is a field-oriented program designed to prepare students for work with children in preschool programs and in primary grades (grades PreK-3). Beginning in the freshman year, students observe and participate in local schools and agencies and in experimental classrooms on campus. Most Liberal Education Core courses are taken in the College of Arts and Science.

Students must combine a major in early childhood education with a second major. Course work beyond the standard 120-hour program may be required for some double majors.

Vanderbilt students seeking teacher licensure must apply through the Office of Teacher Licensure at Vanderbilt and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered Vanderbilt. Licensure requirements are currently undergoing change. Each year, teacher licensure candidates should consult the current *Vanderbilt Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Undergraduate Student Affairs.

### B.S. Degree Requirements Early Childhood Education (PreK-3 Licensure)

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students take a minimum of 120 hours, distributed as follows:

#### *Liberal Education Core Requirements. Minimum 60 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

### *Professional Education Core. 33 hours.*

EDUC 1220, 3114, 3115, 3120, 3140, 3150, 3180, 3212; HMED 2150; MTED 3150; SPED 1210; SPEDH 3770/3777

### *Field Experiences. 14 hours.*

EDUC 3116, 3151, 4951, 4961

### *A second major is required.*

For students interested in PreK-5 licensure, it may be possible to combine course work from the early childhood major and the elementary major. Interested students should discuss this with Professor Amy Palmeri.

## Elementary Education

THE major in elementary education is field-oriented and designed to prepare students to teach children in grades K-5. Beginning in the freshman year, students observe and participate in local schools and experimental classrooms on campus. Most Liberal Education Core courses are taken in the College of Arts and Science.

Students must combine a major in elementary education with a second major in the liberal arts, an interdisciplinary major, or another major offered by Peabody College or the College of Arts and Science. Course work beyond the standard 120-hour program may be required for some double majors.

Vanderbilt students seeking teacher licensure must apply through the Office of Teacher Licensure at Vanderbilt and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered the program. Licensure requirements are currently undergoing change. Each year, teacher licensure candidates should consult the current *Vanderbilt Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Undergraduate Academic Affairs.



## B.S. Degree Requirements Elementary Education (K–5 Licensure)

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students take a minimum of 120 hours, distributed as follows:

### *Liberal Education Core Requirements. Minimum 60 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

### *Professional Education Core. 28 hours.*

EDUC 1220, 3212, 3214, 3215, 3270; MTED 3250; SCED 3240; SSED 3240; HMED 2250; SPED 1210; PSY-PC 2600

### *Field Experiences. 15 hours.*

EDUC 3216, 3240, 4952, 4962; MTED 3251

### *An approved second major is required.*

For students interested in PreK-5 licensure, it may be possible to combine course work from the early childhood major and the elementary major. Interested students should discuss this with Professor Amy Palmeri.

## Secondary Education

THE major in secondary education is designed to prepare the student to teach one or more subjects at the secondary level (grades 6–12). Students must complete Liberal Education Core requirements, Professional Education requirements, and a primary area of emphasis in at least one endorsement field, which involves 27 to 36 hours of course work in the discipline and results in a major in that area as defined by the College of Arts and Science. Specific requirements for a second area of endorsement may be obtained from the Office of Teacher Licensure in the Peabody Administration Building. Students must take the appropriate methods course for each area of endorsement.

Vanderbilt students seeking teacher licensure must apply through the Peabody Office of Teacher Licensure and must meet licensure requirements in effect at the time of their

graduation, which may be different from licensure requirements in effect at the time they entered Vanderbilt. Licensure requirements are currently undergoing change. Each year, teacher licensure candidates should consult the current Vanderbilt *Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Undergraduate Academic Affairs.

## B.S. Degree Requirements Secondary Education (6–12 Licensure)

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Students take a minimum of 120 hours, distributed as follows:

### *Liberal Education Core Requirements. Minimum 60 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

### *Professional Education Core. 24 hours.*

EDUC 1220, 3310, 3620, 3720; SPED 1210; Literacies course; Content Learning course; Teaching Methods course

### *Field Experiences. 15 hours.*

EDUC 3871, 3872; ENED, MTED, SCED, SSED 3371 and 4963; EDUC 4953

### *An approved second major is required.*

# Major in Human and Organizational Development

CHAIR Paul W. Speer

DIRECTOR OF UNDERGRADUATE STUDIES Leigh Z. Gilchrist

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Andrew J. Finch, Brian A. Griffith, Christine M. Quinn Trank

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Safransky, Matthew G. Springer

RESEARCH ASSOCIATE PROFESSOR Emily Tanner-Smith

ASSISTANT PROFESSORS OF THE PRACTICE Gina L. Frieden, Leigh  
Z. Gilchrist, Brian L. Heuser, David Laird, Dayle A. Savage, Heather L.  
Smith, Sarah V. Suiter

PRINCIPAL SENIOR LECTURERS Leslie D. Kirby, Andrew J. Van Schaack

SENIOR LECTURER Susan M. Kochanowski

LECTURERS Corbette Doyle, Susan K. Friedman, Allison P. McGuire,  
Rachel B. Robinson, Kristen C. Tompkins

THE Human and Organizational Development major prepares students to solve human problems in organizations and communities. Doing so requires knowledge of human development, group dynamics, organizational theory and behavior, economics, public policy, statistics, and methods of inquiry. The curriculum is planned to ensure that students obtain a strong foundation in science and liberal arts, with an emphasis on developing writing, oral presentation, and analytic skills.

In addition to the core curriculum, students select a concentration or track that provides a focus for their study during the junior and senior years. The track options are Community Leadership and Development, Health and Human Services, International Leadership and Development, Leadership and Organizational Effectiveness, and Education Policy. Many students also add an additional major or minor which is handled through the respective departments of those programs.

The HOD program is guided by an active learning approach to education. Students learn new ideas and concepts through seminars, simulations, case studies, field experiences, and interaction with professionals in the field. In addition, students are required to complete a semester-long internship during which they demonstrate the core competencies of HOD: understanding and solving problems in organizations and communities. Through the coursework that accompanies the internship, students integrate and apply concepts from earlier classes to analyze organizational performance and complete a project that enhances the effectiveness of the organization. Because the student chooses the internship placement, this experience also provides valuable vocational and career development in the student's field of interest. Students can apply for internships in Nashville, Chicago, New York, San Francisco, Washington, D.C., and London, England.

Graduates of the program assume positions in business, government agencies, social enterprises, and non-profit organizations. In addition, many students enter graduate or professional programs in business, community development, counseling, divinity, education, health promotion, human resource development, law, or medicine.

The core curriculum is designed to help students:

1. Understand the basic principles and typical patterns of human development across the life cycle and use this knowledge to understand their own behavior and the behavior of others;
2. Understand the principles of group dynamics and use this knowledge to provide leadership and facilitate decision making in small group settings;
3. Understand theories of organizations and apply them to the solution of organizational problems;
4. Apply quantitative and qualitative methods of systematic inquiry and analysis;
5. Understand basic economics including monetary and fiscal theory;
6. Understand public policy processes and the factors that influence policy making;
7. Understand the ethical dimensions of personal and organizational decisions and apply this understanding to analyze social issues and make professional and personal decisions;
8. Develop enhanced skills of synthesis including the ability to integrate ideas from various sources, to appreciate diversity, and to design innovative programs.

In addition, the program helps students develop the following skills:

1. *Written communication* with emphasis on developing a clear, concise, expository style and mastering the practical forms used in professional situations;
2. *Oral presentation* with emphasis on making informative and persuasive presentations with the effective use of technology and media;
3. *Analytic thinking* with emphasis on applying analysis, creative thinking, and the skills of systems thinking to the recognition, definition, and solution of personal, professional, organizational, and social problems;
4. *Interpersonal communication* with emphasis on inquiry, advocacy, and conflict resolution skills;
5. *Leadership* with emphasis on motivating others, managing talent, and teamwork.

## Honors Program

The HOD Honors Program is designed for highly motivated students who are looking for an opportunity to pursue intensive study in personal areas of interest. It offers outstanding undergraduate HOD majors an opportunity to undertake advanced reading and become involved in research teams with professors and graduate students. The program also offers special opportunities for individual supervision that will help students develop writing and presentation skills to compete successfully in the world's best graduate programs.

The program is open to students who have completed the sophomore year with a 3.6 cumulative (overall) GPA. Students admitted to the honors program participate in advanced

research for two semesters and completion of the honors thesis. Students are also encouraged to attend departmental colloquia and to take at least one graduate course in their area of interest.

## Curriculum

Students take a minimum of 120 hours.

### *Liberal Education Core Requirements. 40 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-Year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-Year Seminars when open registration begins.

### *Human and Organizational Development Professional Core. 18–20 hours.*

These courses are listed in the Courses of Study section under Human and Organizational Development and will include the following topics:

HOD 1250. Applied Human Development  
 HOD 1251. Intrapersonal Development\*  
 HOD 1300. Small Group Behavior  
 HOD 1301. Interpersonal Development\*  
 HOD 2100. Understanding Organizations  
 HOD 2400. Talent Management and Organizational Fit  
 HOD 2500. Systematic Inquiry  
 HOD 2700. Public Policy

\*not required for students who transfer to the HOD major

### *Practicum and Internship. 12–18 hours.*

The program includes a full-time internship (12–15 hours) and an optional 3-hour practicum experience.

### *Track. 15 hours.*

A block of courses within the student's area of concentration: (1) Community Leadership and Development, (2) Health and Human Services, (3) International Leadership and Development, (4) Leadership and Organizational Effectiveness, and (5) Education Policy.

### *Electives. 30–35 hours.*

## The Minor in Human and Organizational Development

The minor in human and organizational development consists of 18 hours in the following courses:

REQUIRED COURSE. 3 hours.

HOD 1250 Applied Human Development

CHOOSE TWO ADDITIONAL CORE COURSES. 6 hours.

HOD 1300. Small Group Behavior  
 HOD 2100. Understanding Organizations (required for Leadership and Organizational Effectiveness track students)  
 HOD 2500. Systematic Inquiry (prerequisite for HOD 2700, Public Policy)  
 HOD 2700. Public Policy (HOD 2700 or PSCI 1100 required for Education Policy track students)

TRACK LEVEL COURSES: 9 hours.

Students will choose three courses (9 hours) from a single track to complete. The tracks are Community Leadership and Development, Health and Human Services, International Leadership and Development, Leadership and Organizational Effectiveness, and Education Policy.

#### *Community Leadership and Development Track [9 hours]*

The 9-hour CLD track core requires three of the following five courses:

HODC 3202. Community Development Theory  
 HODC 3212. Community Development Organizations and Policies  
 HODC 3222. Action Research and Program Evaluation  
 HODC 3232. Ethics for Human Development Professionals  
 HODC 3342. Introduction to Community Psychology

#### *Health and Human Services Track [9 hours]*

The 9-hour HHS track core requires three of the following five courses:

HODH 3201. Introduction to Human Services  
 HODH 3211. Introduction to Counseling  
 HODH 3221. Health Service Delivery to Diverse Populations  
 HODH 3231. Introduction to Health Services  
 HODH 3241. Introduction to Health Policy

#### *International Leadership and Development Track [9 hours]*

The 9-hour ILD track core requires three of the following seven courses:

HODI 3200. Global Dimensions of Community Development  
 HODI 3210. Leadership and Change in International Organizations  
 HODI 3220. International Organizations and Economic Development  
 HODI 3230. Education and Economic Development  
 HODI 3240. Effectiveness in International For-Profit Organizations  
 HODI 3250. Building Knowledge Economics in Asia  
 HODI 3260. Education in the Asia-Pacific Region: Development, Reform, and Innovation

#### *Leadership and Organizational Effectiveness Track [9 hours]*

The 9-hour LOE track core includes the following required courses:

HODL 3204. Leadership Theory and Practice (prerequisite HOD 2100) (Concurrent enrollment allowed)  
 HODL 3234. Advanced Organizational Theory (prerequisite HOD 2100) (Concurrent enrollment allowed)

#### *And*

One course chosen from the following five options:

HODL 3224. Analyzing Organizational Effectiveness  
 HODL 3244. Introduction to Human Resource Development  
 HODL 3254. Human Resource Management  
 HODL 3264. Evidence-based Practice in Organizations (prerequisite HOD 2100; concurrent enrollment allowed)  
 HODL 3274. Managing Organizational Change (prerequisite HOD 3204 or HOD 3234)

#### *Education Policy Track [9 hours]*

The 9-hour EP track core has the following required courses:

HODE 3205. Education Policy Analysis Methods (prerequisite HOD 2700 or PCSI 1100)  
 HODE 3215. Education and Public Policy (prerequisite HOD 2700 or PCSI 1100)  
 HODE 3225. Introduction to Public Finance of Education

Total hours in the minor: 18

# Major in Special Education

CHAIR Joseph H. Wehby

DIRECTOR OF UNDERGRADUATE STUDIES Andrea M. Capizzi,

PROFESSORS EMERITI Anne L. Corn, Joseph J. Cunningham, Floyd Dennis, Jr., Randall Harley, Carolyn Hughes, Daniel J. Reschly, Mark Wolery

PROFESSORS Erik Carter, Laurie Cutting, Donna Ford, Douglas Fuchs, Lynn S. Fuchs, Mary Louise Hemmeter, Robert Hodapp, Ann P. Kaiser, Paul J. Yoder

PROFESSOR OF THE PRACTICE Kimberly J. Paulsen

RESEARCH PROFESSOR Ted Hasselbring

ASSOCIATE PROFESSORS Deborah D. Hatton, Jeanne Wanzek, Joseph H. Wehby

ASSOCIATE PROFESSOR OF THE PRACTICE Naomi Tyler

ASSISTANT PROFESSORS Erin Barton, Victoria Knight, Jennifer Ledford, Chris Lemons, Blair Lloyd

ASSISTANT PROFESSORS OF THE PRACTICE Karen Blankenship, Andrea M. Capizzi, Alexandra Da Fonte, Joseph M. Lambert

RESEARCH ASSISTANT PROFESSORS Tamra Stambaugh, Sandra Wilson

THE undergraduate program in special education prepares students to work with persons with disabilities and leads to licensure in special education. Students pursue an interdisciplinary major in exceptional learning with emphasis in one of the three specialty areas: high-incidence disabilities (modified program), multiple and severe disabilities (comprehensive program), or visual impairment. This major can be combined with other majors in education, human and organizational development, cognitive studies, child development, or Arts and Science. The program is field oriented and problem centered, with most professional courses requiring direct involvement with individuals with disabilities. Beginning in the freshman year, students observe and work in a variety of educational settings in local schools and in classrooms on campus.

Vanderbilt students seeking teacher licensure must apply through the Office of Teacher Licensure at Vanderbilt and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered the program. Each year, teacher licensure candidates should consult the current *Vanderbilt Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Administration and Records.

## Honors Program

The Honors Program in Special Education offers qualified majors the opportunity to gain experience in conducting research in collaboration with a faculty mentor. This experience culminates in the writing and presentation of a senior thesis. Students who major in special education are eligible to apply for the Honors Program in the spring of their sophomore year if they have an overall grade point average of 3.5. Students who are accepted into the Honors Program, successfully complete the program, and maintain the required grade point averages, will graduate with Honors in Special Education. Specific information concerning admission to and the requirements of the Honors Program in Special Education is available from Professor Andrea Capizzi, director of undergraduate studies for the Department of Special Education.

Students should be aware that participation in the Honors Program is quite time-intensive and represents a substantial commitment of time and effort across at least three semesters. Therefore, potential participants must carefully consider whether they are able to, and want to, devote the required time and energy to this program.

## B.S. Degree Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: [registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/](http://registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/).

Specializations are available in high-incidence disabilities/interventionist (grades K–12 modified licensure), severe disabilities (grades K–12 comprehensive licensure), and visual impairment (grades PreK–12 visual impairment licensure). Total hours will vary depending on the area of specialization.

Students take a minimum of 120 hours, distributed as follows:

### *Liberal Education Core Requirements. Minimum 60 hours.*

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

### *Writing Requirement*

All Peabody College freshmen who have not earned a combined score of 1220 on the Writing and Critical Reading components of the SAT with a minimum score of 500 in each component, or ACT English score of 27 or higher and writing score of 7 or higher, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation all students must successfully complete a second writing-intensive course.

NOTE: First-Year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-Year Seminars when open registration begins.

### *Specializations*

The following SPED course is taken as part of the Liberal Education Core, but is also required in each area of specialization.

SPED 1210. Introduction to Exceptionality

The following courses are required in each area of specialization.

SPED 1175. Freshman Seminar

SPED 2310. Managing Academic and Social Behavior

SPED 4950. Professional Seminar

SPED 4954 or 4951. Student Teaching

## SEVERE DISABILITIES PROGRAM/COMPREHENSIVE CORE.

- SPEDS 2120. Issues in Family Intervention  
 SPEDS 2450. Augmentative and Alternative Communications  
 SPEDS 2430. Introduction to Language and Communications\*  
 SPEDS 3300. Methods of Instruction for Students with Severe and Multiple Disabilities  
 SPEDS 3312. Procedures in Transition to Adult Life  
 SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties: K-8  
 SPEDH 3338. Teaching Reading to Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDS 3330. Characteristics of Students with Severe and Multiple Disabilities  
 SPEDS 3350. Access to General Education and Teaching Functional Academics  
 SPEDS 3661. Fieldwork in Special Education: Severe Disabilities  
 SPEDS 3667. Seminar in Severe Disabilities Fieldwork  
 SPEDS 3871. Field Work in Special Education: Autism, Intellectual, and Multiple Disabilities

## HIGH-INCIDENCE PROGRAM/MODIFIED/INTERVENTIONIST CORE.

- (Courses and specific to choice of licensure track.)  
 SPED 2160. Cultural Diversity in American Education\*  
 SPEDH 3308. Understanding Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3318. Assessment for Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties: K-8  
 SPEDH 3338. Teaching Reading to Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3348. Language and Learning\*  
 SPEDH 3358. Advanced Reading Methods for Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3368. Teaching Middle School Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3378. Teaching High School Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3388. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties 6-12  
 SPEDH 3777. School and Classroom Supports for Teaching Students with Academic Behavior Difficulties  
 SPEDH 3871. Field Work in Special Education for Mild/Moderate Disabilities

## VISUAL IMPAIRMENT PROGRAM CORE.

- SPEDS 2120. Issues in Family Intervention\*  
 SPEDS 2430. Introduction to Language and Communication\*  
 SPEDV 3305. Medical and Educational Implications of Visual Impairment  
 SPEDV 3315. Educational Procedures for Students with Visual Impairment  
 SPEDV 3335. Braille Reading and Writing  
 SPEDV 3345. Communication and Literacy Skills for Students with Visual Impairment  
 SPEDV 3355. Orientation and Mobility for Teachers of the Visually Impaired  
 SPEDV 3385. Advanced Procedures for Students with Visual Impairments  
 SPEDH 3871. Field Work in Special Education for Mild to Moderate Disabilities  
 SPEDH 3318. Assessment Strategies for Students with Severe and Persistent Academic Difficulties  
 SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties  
 SPEDH 3368. Teaching Middle School Students with Severe and Persistent Academic and Behavior Difficulties

\*Taken as part of the Liberal Education Core

**Minor in Special Education**

The minor in special education provides students with an opportunity to develop familiarity and expertise in working with children who have learning and social behavior problems. The minor requires 17 hours (15 unique to the minor) as detailed below.

**Required for all tracks (3 hours)**

- SPED 1210. Introduction to Exceptionality (3)

**Electives (14 hours)**

- SPED 2310/3871. Managing Academic and Social Behavior (fieldwork) [3/1]  
 SPEDH 3308. Understanding Students with Severe and Persistent Academic and Behavior Difficulties [3]  
 SPEDH 3328/3871. Teaching Math to Students with Academic and Behavior Difficulties (fieldwork) [3/1]  
 SPEDH 3338/3871. Teaching Reading to Students with Academic and Behavior Difficulties (fieldwork) [3/1]  
 SPEDH 3348. Language and Learning [3]  
 SPED 2160. Cultural Diversity in American Education [3]  
 SPEDS 2120. Family Intervention [3]  
 SPED 2340. Introduction to Language and Communication [3]  
 SPED 3330/3871. Characteristics of Severe and Multiple Disabilities (fieldwork) [3/1]  
 SPED 3312/3871. Procedures in Transition to Adult Life (fieldwork) [3/1]  
 SPEDS 3350. Access to General Education and Teaching Functional Academics [3]  
 SPEDV 3305. Medical and Educational Implications of Visual Impairments [3]  
 SPEDV 3315. Educational Procedures for Students with Visual Impairments [3]  
 SPEDV 3335. Braille Reading and Writing [2]  
 SPEDV 3345. Communication Skills for Students with Visual Impairments [3]  
 SPEDV 3385. Advanced Procedures for Students with Visual Impairments [3]

Most courses are taught in sequence and have prerequisite courses.

# Honors

## Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the Dean after consideration of faculty recommendation and overall academic achievements, as well as grade point averages of the year's highest ranking summa cum laude graduates.

## Latin Honors Designation

Honors, which are noted on diplomas and published in the Commencement Program, are earned as follows:

*Summa Cum Laude.* Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's Vanderbilt graduating seniors.

*Magna Cum Laude.* Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's Vanderbilt graduating seniors.

*Cum Laude.* Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's Vanderbilt graduating seniors.

## Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded hours, with no temporary or missing grades in any course (credit or non-credit), and no grade of *F*.

## Kappa Delta Pi

Kappa Delta Pi is an education honor society organized in 1911 at the University of Illinois to foster excellence in scholarship, high personal standards, improvement in teacher preparation, distinction in achievement, and contributions to education. Membership is limited to juniors and seniors with a grade point average of 3.500 or better, and graduate students with a grade point average of 3.750 or better. Candidates for membership must have completed at least 9 hours in education or psychology.

## Honor Societies for Freshmen

Freshmen who earn grade point averages of 3.500 or better for their first semester are eligible for membership in the Vanderbilt chapters of Phi Eta Sigma and Alpha Lambda Delta.

## Awards

KEVIN LONGINOTTI AWARD. Awarded annually to a graduating senior in the Department of Teaching and Learning who shows exceptional promise as a future teacher at the secondary school level.

DOROTHY J. SKEEL AWARD FOR OUTSTANDING PROFESSIONAL PROMISE (ELEMENTARY/EARLY CHILDHOOD EDUCATION). Presented annually to the graduating senior in the Department of Teaching and Learning who has shown exceptional promise as a future teacher at the elementary school or early childhood level.

SENIOR THESIS AWARD. Awarded to the graduating senior in the Human and Organizational Development Program who has submitted the most outstanding senior thesis. The winner is selected from a group of five finalists who make an oral presentation of their theses to a panel of five professors.

THE DEPARTMENT OF SPECIAL EDUCATION DISTINGUISHED ACADEMIC ACHIEVEMENT AWARD. Awarded annually to the graduating senior in the Department of Special Education who exemplifies the highest level of academic achievement.

THE DISTINGUISHED SERVICE IN SPECIAL EDUCATION AWARD. Presented annually to the graduating senior in the Department of Special Education who exemplifies the highest commitment to professional service in special education.

THE PEABODY ALUMNI AWARD. Awarded by the Peabody Alumni Association to a member of the graduating class who has demonstrated outstanding qualities of scholarship and leadership.

THE WILLIS D. HAWLEY AWARD. Awarded by students of Peabody College to a senior who exemplifies Peabody's commitment of service to others.

DEAN'S AWARD FOR OUTSTANDING SCHOLARSHIP. Awarded to each summa cum laude graduate.

YOUNG ALUMNI BOARD AWARD. Awarded by Peabody students to a senior who has demonstrated outstanding qualities of scholarship, leadership, and commitment of service to others. The recipient of this award represents the graduating class as a member of the alumni board for a two-year term.

PSYCHOLOGY AND HUMAN DEVELOPMENT UNDERGRADUATE HONORS AWARD. Awarded to the graduating senior who has successfully completed the Undergraduate Honors program in Cognitive Studies, or Child Development, or Child Studies and who has produced the best overall honor project.

EXCELLENCE IN CHILD DEVELOPMENT AWARD. Awarded to the graduating senior majoring in Child Development whose work in the opinion of the faculty of the Department of Psychology and Human Development exemplifies academic excellence.

EXCELLENCE IN COGNITIVE STUDIES AWARD. Presented annually by the Department of Psychology and Human Development to the graduating senior who most clearly exemplifies the goals of the Cognitive Studies Department.

HUMAN AND ORGANIZATIONAL DEVELOPMENT AWARDS. Established in 1999 and presented to the graduating seniors who exemplify the highest levels of scholarship and leadership in the Human and Organizational Development Program. The awards are given in these areas: Community Service, Outstanding Community Development and Social Policy, Outstanding Health and Human Services, and Outstanding Leadership and Organizational Effectiveness.

SPECIAL EDUCATION TEACHER OF EXCELLENCE AWARD. Established in 1999. Awarded annually by the Department of Special Education to the graduating senior who has demonstrated the highest level of excellence in teaching in the area of special education.

# Post-Baccalaureate Programs

PEABODY offers professional degree programs in the following areas. Details of the post-baccalaureate programs are published in the *Peabody College Catalog*, available on request from the Office of Admissions and Records at Peabody College.

Major	Degree	Department
Child Studies	M.Ed.	Psychology and Human Development
Clinical Psychological Assessment	M.Ed.	Psychology and Human Development
Community Development and Action	M.Ed.	Human and Organizational Development
Education Policy	M.P.P.	Leadership, Policy, and Organizations
Educational Leadership and Policy		Leadership, Policy, and Organizations
Elementary Education	M.Ed.	Teaching and Learning
English Language Learners	M.Ed.	Teaching and Learning
Higher Education Administration	M.Ed.	Leadership, Policy, and Organizations
Higher Education Leadership and Policy		Leadership, Policy, and Organizations
Human Development Counseling	M.Ed.	Human and Organizational Development
Independent School Leadership	M.Ed.	Leadership, Policy, and Organizations
International Education Policy and Management	M.Ed.	Leadership, Policy, and Organizations
Leadership and Organizational Performance	M.Ed.	Leadership, Policy, and Organizations
Learning and Instruction	M.Ed.	Teaching and Learning
Learning, Diversity, and Urban Studies	M.Ed.	Teaching and Learning
Quantitative Methods	M.Ed.	Psychology and Human Development
Reading Education	M.Ed.	Teaching and Learning
Secondary Education	M.Ed.	Teaching and Learning
Special Education	M.Ed.	Special Education

## Five-year Child Studies Program at Peabody

The five-year Child Studies program offered by Peabody College is designed to blend the undergraduate program with the master's level program. Students who successfully complete this combined program will earn their undergraduate B.S. degrees and also earn their M.Ed. degrees by the end of their fifth year at Peabody.

Under the combined five-year plan, undergraduates take 6 credit hours of professional courses during the senior year as part of the 120 hours required for the B.S. degree. Professional credit hours may not be used to satisfy undergraduate major course requirements. A fifth year (including summer) follows, during which students complete the additional 30 professional hours necessary for the master's degree. Students in this five-year program may take 6 hours during the senior year. Students who plan to pursue a five-year program are required to abide by the following guidelines; admission is competitive, and meeting minimum requirements does not guarantee admission.

- Students should make application to the program by the middle of the junior year at Vanderbilt.
- Applicants must have earned a minimum 3.00 grade point average.
- Courses may not be transferred from another university as a part of the master's degree.

## Child Studies

The master of education (M.Ed.) in Child Studies is designed to give strong undergraduate students graduate preparation and related supervisory experience pertinent to career development or further graduate/professional study involving children, adolescents, families, schools, and related community services.

This 36-hour master's program consists of 12-18 credit hours of core curriculum course work and 18-24 credit hours of elective course work that are individually tailored to each student's personal interests and professional goals. Our program offers traditional classroom preparation alongside hands-on practicum experiences or research mentorships, which are integrated into the program of studies.

All students choose to complete one of two tracks: the Applied Professional Track or the Empirical Research Track. Both program options require that students become skilled in integrating current child development research and theory with effective practice in academic or professional settings. Required courses focus on applied child development, developmental theory, and research methodology. Within each track, there are additional areas of concentration including, but not limited to, pediatric health care, developmental disabilities and early intervention services, early childhood, child advocacy and public policy, youth development, poverty and interventions, and arts and media. This degree culminates in a capstone project exam that reflects the unique set of academic and professional experiences that compose the students' program of studies.

# Peabody College Courses

## Human and Organizational Development

**HOD 1001. Commons Seminar.** [Formerly HOD 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

**HOD 1115. First-Year Seminar.** [Formerly HOD 1150] Selected Topics for first-year students [3]

**HOD 1250. Applied Human Development.** [Formerly HOD 1000] Introduction to the processes of human development and how such development can be influenced. Emphasis is placed on social development and implications for solving personal and professional problems. The course focuses on late adolescent and young adult development. Corequisite for freshman H&OD majors: HOD 1251. [3]

**HOD 1251. Intrapersonal Communication.** [Formerly HOD 1001] The course is designed for first semester freshmen. It includes exploration and clarification of values, setting personal objectives, and preliminary skill building in active listening, assertiveness, and conflict resolution. HOD 1251 is a course for freshman H&OD majors only. Corequisite: HOD 1250. [1]

**HOD 1300. Small Group Behavior.** [Formerly HOD 1100] Designed to improve the student's ability to analyze behavioral patterns in groups such as leadership, conflict, and decision making and group roles. The student is expected to improve his/her abilities by effective participation in the group as well as in written analyses. Problems for analysis are drawn from events in the group and from theoretical readings. Corequisite for freshman H&OD majors: HOD 1301. [3]

**HOD 1301. Interpersonal Communication.** [Formerly HOD 1101] This course is designated for second-semester freshmen with an H&OD major. It provides skill development in interpersonal communication and group dynamics. Corequisite: HOD 1300 section one. [1]

**HOD 2100. Understanding Organizations.** [Formerly HOD 1200] Introduction to theory and research on human behavior in organizations. Aimed at providing a framework for understanding the dynamics of organizations around the basic issues that confront all organizations (e.g., goal setting, work performance, leadership, decision making, managing change). [3]

**HOD 2260. Economics of Human Resources.** [Formerly HOD 2260] An introduction to economics, with heavy emphasis on microeconomics of the family, household, consumer, and business firm. Applications to the economics of government, poverty, discrimination, labor markets, the environment, education, and other human resource and human development topics will be included. The class will be primarily lecture format with some small group interactions and discussions. [3]

**HOD 2400. Talent Management and Organizational Fit.** [Formerly HOD 1400] This course examines the theories, concepts, tools, and processes associated with talent management and synergistic organizational fit. Given that organizations recognize that employee talents, skills, and motivations drive organizational performance and success, students will explore the theories, concepts, and processes organizations use to plan, source, attract, select, train, monitor, develop, retain, promote, and move employees through the organization. It provides a deeper understanding of organizational performance and HR/talent, strategy, and core competency alignment issues. Outcomes from this course are applied and built upon in the HOD capstone internship experience. [3]

**HOD 2500. Systematic Inquiry.** [Formerly HOD 1700] Qualitative and Quantitative research methods with an emphasis on formulating clear and concise questions, evaluating authoritative sources of information, designing and conducting research studies, and reporting results in a professional format. [3]

**HOD 2700. Public Policy.** [Formerly HOD 1800] An exploration of the foundations of public policy, the policy process, and the factors that influence policy making at the national and state levels, with particular attention to the development of student analytic and writing skills. Prerequisite: HOD 2500. [3]

**HOD 3850. Independent Study in Human and Organizational Development.** [Formerly HOD 2980] Individual programs of reading or the conduct of Research studies in human and organizational development. Consent of supervising faculty member required. May be repeated. [1-3]

**HOD 3860. Directed Research.** [Formerly HOD 2989] Consent of supervising faculty member required. May be repeated. [1-3]

**HOD 3864. Research Experience.** [Formerly HOD 2950] This course provides undergraduate students in HOD direct experience in conducting research. The course is designed for students interested in going on to graduate school as well as students who want to gain experience in generating knowledge in an information economy. The course conducts a review of research methodologies and requires students to critically read and deconstruct published research studies. Data analysis skills are sharpened in the computer lab and put into practice on their own research. Students conduct several independent research projects during the semester. Prerequisite: HOD 2500 and a statistics class. [3]

**HOD 3870. Practicum in Human and Organizational Development.** [Formerly HOD 2000] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

**HOD 3890. Special Topics in Human and Organizational Development.** [Formerly HOD 2290] Exploration of special issues on topics related to human and organizational development. May be repeated for credit with change of topic. [1-3]

**HOD 4950. Human Development Internship.** [Formerly HOD 2900] An intensive work experience which involves working four days a week for one semester. The internship includes completion of a specific project for the organization. Corequisite: HOD 4951, 4952, 4953. [3-6]

**HOD 4951. Advanced Seminar in Human and Organizational Development.** [Formerly HOD 2910] Provides an opportunity to integrate human development theory, knowledge, and skills by applying them to the solution of problems in internship settings. Corequisite: HOD 4950, 4952, 4953. [3]

**HOD 4952. Theoretical Applications of Human and Organizational Development.** [Formerly HOD 2920] Students complete assignments and structured activities that demonstrate their ability to apply theories and skills acquired in the six Human Development Program core courses to understanding situations and solving problems that naturally occur during their internship experience. Must be taken in conjunction with the Human and Organizational Development program internship. Corequisite: HOD 4950, HOD 4951, HOD 4953. Prerequisite: HOD 1250, 1300, 2100, 2400, 2500, 2700. [3]

**HOD 4953. Senior Project.** [Formerly HOD 2930] Students complete a specific project or assemble a portfolio that demonstrates their professional competence in their area of specialization. The portfolio includes written products and a videotape oral presentation on a topic appropriate to the student's area of specialization. [3]

**HOD 4960. Honors Capstone Internship.** [Formerly HOD 2940] Students admitted to the Human and Organizational Development Honors Program may complete a capstone internship. [3]

**HOD 4978. Senior Thesis.** [Formerly HOD 2960] [3]

**HOD 4980. Human and Organizational Development Honors Seminar.** [Formerly HOD 2990] Open to students majoring in human and organizational development who are admitted to the Honors Program. [3]



## Community Development and Leadership

### **HODC 3202. Community Development Theory.** [Formerly HOD 2600]

This is a core course in the Community Leadership and Development (CLD) track of the HOD undergraduate program. It is designed to provide a general introduction to the field of community development (CD) by examining appropriate theoretical perspectives. Ecological theory, critical theory, and theories of democracy will be studied for their application to community development issues. The theoretical perspectives examined in the course will also be linked to the diverse fields which inform community development, such as community psychology, sociology, geography, anthropology, education, and planning. Additionally, the course will provide students a more in-depth understanding of particular community development issues by exploring how alternative theoretical perspectives interpret several important community development phenomena. The course will prepare students to understand the theoretical orientations that underlie the dynamics of community development. [3]

### **HODC 3212. Community Development Organizations and Policies.**

[Formerly HOD 2610] Introduction to the practice of community development (CD), including analysis of, and experience with, CD issues, organizations, and policies. Prepares students to work with public or community agency staff, administrators, planners, policy-makers, or community organizers and leaders, who require analysis and recommendations on particular community issues. Students may also develop experience as part of a research, intervention, or policy development team. The course also focuses on ways ordinary people can become involved in improving their own neighborhoods, communities, and city. [3]

### **HODC 3222. Action Research and Program Evaluation.** [Formerly HOD 2620]

This is a specialty core requirement for the Community Leadership and Development (CLD) track in the Human and Organizational Development program. Course teaches policy-relevant field research methods in the context of action science. Students do an actual research project for a client organization and prepare a report with recommendations for policy and action. Students get experience in the conduct of the research as a team of a fictitious consulting organization. [3]

### **HODC 3232. Ethics for Human Development Professionals.** [Formerly HOD 2280]

(Also listed as HOD 5100 for professional students) Normative evaluation of ethical issues in serving human need. Conflicting values within moral dilemmas will be examined from a variety of theoretical perspectives and practical criteria. Case studies of moral issues confronting the individual, the family, service organizations, and the general public will be reviewed. [3]

### **HODC 3312. Procedures in Transition to Adult Life.** [Formerly HOD 2640]

(Also listed as SPEDS 3312) Overview of history, legislation, and practice in the areas of community and employment integration for persons with disabilities. Emphasis on various strategies for promoting a successful transition from school to life. Students are required to develop instructional plans for integration within the community. Students will apply their skills in community or classroom settings. [3]

### **HODC 3313. Practicum: Transition to Adult Life.** [Formerly HOD 2641]

Field-based application of correlated course content to instructional strategies. Assessing, planning, implementing, and evaluating instructional procedures for community and employment integration. Corequisite: HODC 3312. [1]

### **HODC 3322. Religious and Spiritual Organizations.** [Formerly HOD 2650]

The class focuses on traditional and less studied religious and spiritual organizations and compares and contrasts their features, goals, structures, leaders, and personnel with secular organizations such as businesses. Information is also provided about how religious and/or spiritual features are being incorporated in a variety of organizational settings. [3]

### **HODC 3332. High Poverty Youth: Improving Outcomes.** [Formerly HOD 2665]

(Also listed as SPED 3332) Youth from high poverty backgrounds may be at risk for outcomes that include academic failure, school dropout, drug abuse, unemployment, or incarceration. Students

will be working with schools and community agencies in Nashville to improve outcomes for youth living in high poverty neighborhoods. There will be class meetings as well as ongoing service-learning field experiences. Fieldwork will include mentoring, tutoring, or providing job readiness training to youth in neighborhood community centers or students' high schools. [3]

### **HODC 3342. Introduction to Community Psychology.** [Formerly HOD 2670]

(Also listed as PSY 2470) Theory, research, and action in community psychology. History of mental health care; ecological theories of community, stress, coping, and social support; deviance labeling; community assessment strategies; prevention, empowerment, and community and organizational change programs; societal-level intervention policies. [3]

### **HODC 3650. Community Leadership and Development Seminar.**

[Formerly HOD 2680] Exploration of selected topics related to the community leadership and development track of the Human and Organizational Development program. May be repeated for credit with change of topic. [3]

### **HODC 3850. Independent Study in Community Leadership and Development.**

[Formerly HOD 2986] Individual programs of reading or the conduct of research studies in community leadership and development. Consent of supervising faculty member required. May be repeated. [1-3]

### **HODC 3870. Practicum in Community Leadership and Development.**

[Formerly HOD 2060] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

### **HODC 3890. Special Topics in Community Leadership and Development.**

[Formerly HOD 2690] Exploration of special issues on topics related to community leadership and development. May be repeated for credit with change of topic. [1-3]

## Education Policy

### **HODE 3205. Education Policy Analysis Methods.** [Formerly HOD 2800]

How should the government choose among options to address the country's education problems? The main goal of this course is to introduce students to the concepts, methods, and tools useful in performing policy analysis in general, and to give students practice applying the policy analysis methods to real-world educational policy issues including school vouchers, using measures of teacher value-added, financing higher education, and the importance of resources for schooling and student achievement. Prerequisite: HOD 2700 or PSCI 1100. [3]

### **HODE 3215. Education and Public Policy.** [Formerly HOD 2810]

The course explores contemporary social, philosophical, and political dimensions of education policy, including issues related to civic engagement, equity and school organization, and the ecology of schooling. Course readings and discussions will involve fundamental questions about the relationship between schools and society: What is the purpose of American public education? How do policy values, including equity and excellence, social justice and accountability, shape education policy? How is education policy related to social and economic outcomes and opportunities? Prerequisite: HOD 2700 or PSCI 1100. [3]

### **HODE 3225. Introduction to Public Finance of Education.** [Formerly HOD 2820]

In this course, we first provide a foundation of knowledge for the economics of the public sector. In this part of the course, we will discuss the appropriate role of government activity in a market economy as well as other behavioral consequences of government policy from the perspective of the consumers, the policymakers, regulators, and general taxpayers. After establishing a better understanding of the economics of the public sector, we will examine economic models to explain real world government policymaking with a specific focus on education policy, including the rationale and mechanisms of funding education as well other important policy issues such as the provision of early childhood education, teacher labor markets, and accountability and school choice programs. [3]

**HODE 3315. State and Local Government.** [Formerly HOD 2850] Examines the operation of state and local governments within the American federal system. Students will have met expectations for the course when they are able to express well their understanding of how American state and local governments serve the interests of their residents within a system that is highly charged politically. Prerequisite: HOD 2700 or PSCI 1100. [3]

**HODE 3650. Seminars in Education Policy.** [Formerly HOD 2880] Exploration of special issues related to the education policy track of the Human and Organizational Development program. May be repeated for credit with change of topic. [3]

**HODE 3850. Independent Study in Education Policy.** [Formerly HOD 2988] Individual Programs of reading or the conduct of research studies in education policy. Consent of supervising faculty member required. May be repeated. [1-3]

**HODE 3870. Practicum in Education Policy.** [Formerly HOD 2080] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

**HODE 3890. Special Topics in Education Policy.** [Formerly HOD 2890] Exploration of selected topics related to education policy. May be repeated for credit with change of topic. [1-3]

## Health and Human Services

**HODH 3201. Introduction to Human Services.** [Formerly HOD 2500] This course is a comprehensive and realistic survey of the diverse and dynamic field of human services. Students will examine: (1) significant historical developments; (2) populations served; (3) social welfare/poverty theories; (4) career opportunities; and (5) controversial and ethical issues. The course will emphasize special tasks and activities that are performed by the contemporary human service worker. [3]

**HODH 3211. Introduction to Counseling.** [Formerly HOD 2505] An overview of the counseling profession: theories, techniques, settings, and specialty areas. In addition to lectures and class discussions, the course includes an experiential component designed to increase students' listening and responding skills. By the end of the course, students will have a clear understanding of what being a counselor entails. [3]

**HODH 3221. Health Service Delivery to Diverse Populations.** [Formerly HOD 2510] This course focuses on the study of value systems of diverse groups, as well as variables related to gender, age, lifestyle, religion, social class, race, geography, and developmental state, and how these relate to health status and health service needs. This course provides students with a basic knowledge and understanding of diversity so that they may be more effective in serving the needs of all people. Transportation class fee: \$50.00 [3]

**HODH 3231. Introduction to Health Services.** [Formerly HOD 2525] This course will focus on the evolution of the U.S. health care system, as well as on the evolution of health care systems in diverse environments from around the globe. The content of the course focuses on the nature and dynamics of the macro health system environments and the design and function of organizational models in those environments. Particular attention will be paid to contemporary health service organizational models, such as managed care, integrated delivery systems, and physician-hospital organizations. Topics include education and training of health care professionals, the role of health care providers, public, private, and voluntary agencies, and the interests of major stake holders. [3]

**HODH 3241. Health Policy.** [Formerly HOD 2535] This course presents broad perspectives for understanding health policy within historical, political, and economic contexts. Lectures and assignments will primarily focus on health policy in the United States with a particular emphasis on the Tennessee State Legislature and Metropolitan Davidson County. Opportunities are available for application to national and international issues. Learners will be provided with a foundation from which to base their work, including an overview of the U. S. health care system and public health infrastructure, as well as a framework for conducting policy analyses. [3]

**HODH 3311. Introduction to Health Promotion.** [Formerly HOD 2530] This course is designed to enhance the student's understanding of health promotion concepts that relate directly to improved lifestyle behavior change and disease risk reduction. In addition, health promotion program development, program management, and program initiatives in a variety of settings will be addressed. [3]

**HODH 3321. Introduction to Sports Medicine.** [Formerly HOD 2540] Current topics in sports medicine, with an emphasis on prevention, management, and rehabilitation, and administrative aspects of sports medicine. [3] (Not currently offered)

**HODH 3331. Managing Health Care Organizations.** [Formerly HOD 2550] This is an applied course which combines theoretical knowledge with professional learning experiences, such as case studies, guest lectures, films, management development exercises, and group projects. This course provides a conceptual review of basic managerial functions such as (1) planning, (2) organizing, (3) controlling, (4) staffing, and (5) influencing. The course addresses related managerial activities such as communication, decision making, and legal and legislative issues. Prerequisite: HODH 3201 or HODH 3231. [3]

**HODH 3650. Health and Human Services Seminar.** [Formerly HOD 2580] Exploration of special issues related to the health and human services track of the Human and Organizational Development program. May be repeated for credit with change of topic. [3]

**HODH 3850. Independent Study in Health and Human Services.** [Formerly HOD 2985] Individual programs of reading or the conduct of research studies in health and human services. Consent of supervising faculty member required. May be repeated. [1-3]

**HODH 3870. Practicum in Health and Human Services.** [Formerly HOD 2050] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

**HODH 3890. Special Topics in Health and Human Services.** [Formerly HOD 2590] Exploration of selected topics related to health and human services. May be repeated for credit with change of topic. [1-3]

## International Leadership and Policy

**HODI 3200. Global Dimensions of Community Development.** [Formerly HOD 2400] The globalization process induces new forms of human organization and transforms existing organizations at the community, national, and international levels. This course provides an understanding of the nature, functioning, and development of organizations affected by globalization in societies different from our own and as they relate to multilateral or global institutions that span different social and cultural settings. To do this, the course explores organizations from a comparative perspective, using the analytical framework of human ecology, in terms of differential access to economic and other productive assets, education and information, security and the rule of law, social capital and cultural identity. [3]

**HODI 3210. Leadership and Change in International Organizations.** [Formerly HOD 2410] This course uses an interdisciplinary case study approach to investigate organizational challenges associated with today's international environment. Students examine the impact of culture, politics, and policy, and other international phenomena such as exchange rates, trade, and capital markets on organizational leadership, structure, and performance. Students also explore various dilemmas that confront decision-makers in international organizations as they attempt to reconcile institutional objectives, individual preferences, and varying cultural norms. [3]

**HODI 3220. International Organizations and Economic Development.** [Formerly HOD 2420] The number of international organizations has proliferated since World War II, and their functions have diversified. Some are altruistic. Others are regulatory. Some serve as forums for debate, others as instruments for military action or enforcement of international agreements in such diverse fields as health, labor, agriculture, human rights, environment, culture, and trade. This course addresses how these organizations are financed, how they are governed, and how they create and manage political controversy. It covers their legal mandates and

structure, seeks to develop awareness of issues of human capital and the World Bank, addresses the controversies and debates over globalization and the role of international organizations in the international regulatory environment, and assesses the future of such organizations in an increasingly interdependent world. [3]

**HODI 3230. Education and Economic Development.** [Formerly HOD 2430] This course reviews the history and application of human capital theory. It provides students with examples of applications in economic development policy. It gives students practice in applying common statistical models. It exposes students to current debates in education policy in the World Bank and other international organizations which result from those models. [3]

**HODI 3240. Effectiveness in International For-Profit Organizations.** [Formerly HOD 2470] Intercultural understandings and skills are key in today's job market, due to fast-growing opportunities and challenges in international, multinational and global businesses. In this course students will, through a variety of methodologies, explore the current trends of exploding world trade, emerging nations, competition for talent and resources, and the impact of technology and changing demographics. Additionally, students will develop skills and understandings in working with cultures, managing cross-cultural teams, and the ins and outs of working abroad. [3]

**HODI 3250. Building Knowledge Economics in Asia.** [Formerly HOD 2450] This course focuses on the challenges and opportunities faced by the Asia-Pacific Region in making the transition to knowledge-based economies. Topics cover global, regional, and country-specific policies and initiatives aimed at building the four pillars of the Knowledge Economy (as defined by the World Bank): economic incentive and institutional regime, education, innovation, and information and communications technologies. This course is intended for advanced undergraduate students interested in gaining a deeper understanding of the transformational changes in the vast and diverse region. [3]

**HODI 3260. Education in the Asia-Pacific Region: Development, Reform, and Innovation.** [Formerly HOD 2445] This course focuses on an in-depth analysis of current developments in education and schooling in the vast and diverse Asia-Pacific Region. Students will examine perspectives from educational researchers, policy makers and practitioners on the major issues, concerns and prospects regarding educational developments in the region. [3]

**HODI 3650. International Leadership and Development Seminar.** [Formerly HOD 2480] Exploration of special issues related to the international leadership and development track of the Human and Organizational Development program. May be repeated for credit with change of topic. [3]

**HODI 3850. Independent Study in International Leadership and Development.** [Formerly HOD 2984] Individual programs of reading or the conduct of research in international leadership and development. Consent of supervising faculty member required. May be repeated. [1-3]

**HODI 3870. Practicum in International Leadership and Development.** [Formerly HOD 2040] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

**HODI 3875. Field School in Intercultural Education.** [Formerly HOD 2460] This course takes place in various sites over a 10-week period in the summer session. It provides training in community field research and analysis techniques directed to human, social, and civic development issues. [3]

**HODI 3890. Special Topics in International Leadership and Development.** [Formerly HOD 2490] Exploration of special topics related to international leadership and development. May be repeated for credit with change of topic. [1-3]

## Leadership and Organizational Effectiveness

**HODL 3204. Leadership Theory and Practice.** [Formerly HOD 2700] A systematic study of the formal theories and models of the leadership

process and the research supporting and challenging them. Students will complete a wide range of leadership self-assessments; design a leadership self-development plan; and participate in individual and group problem solving, decision making, conflict resolution, and performance appraisal simulations and case studies focusing on personal and organizational effectiveness. Prerequisite: HOD 2100. [3]

**HODL 3224. Analyzing Organizational Effectiveness.** [Formerly HOD 2715] Effective leaders are able to analyze internal results and external trends in order to make effective decisions. Students will gain first-hand knowledge of the financial and strategic issues critical to effective decision-making through a mix of lectures, case studies and one problem-based learning module. The primary focus will be on the relevant critical thinking skills such as: identifying relevant decision criteria, interpreting trends in the underlying data (both financial and operational), and communicating that analysis to executives in a manner that can be readily digested. [3]

**HODL 3234. Advanced Organizational Theory.** [Formerly HOD 2720] A comprehensive study of current theories and applied research in organizational effectiveness. Emphasis is on the principles and practices of organizational restructuring, organizational development and planned changes, systems and processes, self-managed teams, and Total Quality. Experiential learning through simulations and field work will reinforce systematic inquiry, strategic planning, and applied organizational assessment skills. Prerequisite: HOD 2100. [3]

**HODL 3244. Introduction to Human Resource Development.** [Formerly HOD 2730] An introduction to the theory and practice of human resource development (design and implementation of training in corporate or human service organizations). Special emphasis on roles played by HRD professionals and concepts and skills needed for entry into the profession. [3]

**HODL 3254. Human Resource Management.** [Formerly HOD 2740] A comprehensive survey of human resource management theory, procedures, and practices, with emphasis on the organizational leader's role and responsibilities for recruiting and selection, placement and career development, employee relations, labor relations, performance appraisal, compensation and benefits, workplace ethics, equal employment opportunity, safety and health, legislation and workplace regulations, development of personnel policies and practices, and the techniques of strategic human resource planning. [3]

**HODL 3264. Evidence-based Practice in Organizations.** [Formerly HOD 2745] Accessing and using published research in solving organizational and social problems is a cornerstone of movements in management, education, medicine and a range of other fields. Using evidence from academic research has even become part of the definition of ethical practice in many of these fields. As a result, identifying and appraising research studies that might be used to solve individual, team and organizational problems has become a critical skill for practitioners. From this research, practitioners must be prepared to create actionable interventions and to persuade others to adopt them. Prerequisite: HOD 2100 (concurrent enrollment allowed). [3]

**HODL 3274. Managing Organizational Change.** [Formerly HOD 2750] This course focuses on organizational development philosophy and practices of planned change, and the theory and techniques of organizational consulting. Students will participate in simulations and actual organizational development interventions. Prerequisite: HODL 3204 or HODL 3234. [3]

**HODL 3314. Strategic Planning and Project Management.** [Formerly HOD 2755] This advanced seminar and workshop-based course focuses on the key organizational processes of strategic planning and project management. Building on prior instruction in leadership and organizational theory and practices, students will complete a critical analysis of strategic leadership theory and models of organizational planning. Activities include evaluation of internal and external factors impacting on planning; participation in strategic planning and project management simulations; evaluation of the performance of selected strategic leaders as planners; and practice with key planning tools and technologies. [3]

**HODL 3324. Executive Leadership.** [Formerly HOD 2770] This course introduces students to concepts of leadership involved in various social, political, and corporate domains. Course content relies on biographies of renowned leaders to illustrate principles of executive leadership. [3]

**HODL 3334. Challenges of Leadership.** [Formerly HOD 2710] This course is designed as an extension of the study of leadership theory and practices begun in HODL 3204. Provides opportunities to investigate leadership concepts introduced in HODL 3204 in more depth. Prerequisite: HODL 3204. [3]

**HODL 3650. Leadership and Organizational Effectiveness Seminar.** [Formerly HOD 2780] Exploration of selected topics related to the leadership and organizational effectiveness track of the Human and Organizational Development program. May be repeated for credit with change of topic. [3]

**HODL 3850. Independent Study in Leadership and Organizational Effectiveness.** [Formerly HOD 2987] Individual programs of readings or the conduct of research studies in leadership and organizational effectiveness. Consent of supervising faculty member required. May be repeated. [1-3]

**HODL 3870. Practicum in Leadership and Organizational Effectiveness.** [Formerly HOD 2070] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

**HODL 3890. Special Topics in Leadership and Organizational Effectiveness.** [Formerly HOD 2790] Exploration of selected topics related to the leadership and organizational effectiveness track of the Human and Organizational Development program. May be repeated for credit with change of topic. [3]

## Military Science—Peabody

**MS-PC 1210. Leadership and Personal Development.** [Formerly MS-PC 111] (Formerly MS 111) Leadership is one of the most compelling topics of our time, and might be one of the most important attributes for effectiveness in all levels of human endeavor. The success of one of the most admired and respected institutions in our country, the military is founded upon the understanding and effective application of leadership, and the development of leaders. This course introduces students to the personal challenges and competencies that are critical to effective leadership. The focus is on developing basic knowledge and comprehension of leadership attributes and core leader competencies in a universal setting and exploring potential applications of these principles and practices at Vanderbilt, in the military and in the corporate world. [1]

**MS-PC 1210L. Leadership and Personal Development Lab.** [Formerly MS-PC 111A and MS 111A] Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations. Within the military science curriculum, this process is called the Leadership Development Program (LDP), modeled after the principles spelled out in *Field Manual 22-100, Army Leadership*, and standardized both on campus and Leadership Development and Assessment Course (LDAC) environments. The flexible methodology of LDP accommodates personalized, individual development at all levels of proficiency throughout the officer educational experience, from program entry to commissioning. The LDP includes basic leadership training, periodic assessment and counseling at both team and individual levels by experience observers. Trends and deficiencies are identified and addressed with retraining and reassessment in a continuous cycle. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. Student performance in leadership roles is assessed and notable strengths and weaknesses are identified. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

**MS-PC 1230. Leadership and Personal Development II.** [Formerly MS-PC 113] (Formerly MS 113) What motivates others to follow a person is intriguing, inspiring and alluring. Through routine observation, we learn from leaders regardless of the setting (military, business, education, etc.) This course provides an overview of leadership fundamentals such as setting direction, problem-solving, listening, and providing feedback. You will explore dimensions of leadership, values, attributes, skills, and actions in a military context through practical, hands-on, and interactive exercises. [1]

**MS-PC 1230L. Leadership and Personal Development II Lab.** [Formerly MS-PC 113A] (Formerly MS 113a) Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations, this process is called the Leadership Development Program. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

**MS-PC 2150. Foundations of Leadership.** [Formerly MS-PC 150] (Formerly MS 151) This course introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for future commissioned Army officers. The class is broken down into five key skill development areas: (1) values and ethics, (2) personal development, (3) officership, (4) leadership and, (5) tactics and techniques. The class emphasizes individual leadership values and characteristics with a focus on leadership theory and interpersonal communications, army values, troop leading procedures, problem solving, and team building in a military environment. [2]

**MS-PC 2150L. Foundations of Leadership Lab.** [Formerly MS-PC 150A] (Formerly MS 151) This lab builds upon the classroom topics in MS-PC 2150 and introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for the future commissioned officers. The lab is broken down into five key skill development areas: (1) leadership, (2) values and ethics, (3) personal development, (4) professional officership, and (5) various tactics, techniques, and procedures. The lab emphasizes individual leadership values and characteristics with a focus on leadership theory and interpersonal communications, army values, troop leading procedures, problem solving, and team building in a military environment. [1]

**MS-PC 2160. Foundations of Tactical Leadership.** [Formerly MS-PC 152] This course builds upon MS-PC 2150. The course is broken down into five key skill development levels: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. This class will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [1]

**MS-PC 2160L. Foundations of Tactical Leadership Lab.** [Formerly MSPC 152A] This course builds upon MS-PC 2150 and 2150L. The lab is broken down into five key skill development levels: (1) leadership, (2) values and ethics, (3) personal development, (4) professional officership, and (5) various tactics, techniques, and procedures. This class will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [1]

**MS-PC 3110. Leadership and Problem Solving.** [Formerly MS 211] This course builds upon your skills developed in MS-PC 2160 (1520), and continues to develop leadership, officership skills, self-awareness, and critical thinking skills through challenging scenarios related to small-unit tactical operations. Cadets receive systematic and specific feedback on their leadership values, attributes, skills, and actions. Prerequisite: MS-PC 1210 (111), 1230 (113), 2150 (150), and 2160 (152) [3]

**MS-PC 3120. Applied Team Leadership.** [Formerly MS-PC 212] (Formerly MS 212) Challenging scenarios related to small-unit tactical operations are used to develop self-awareness and critical thinking skills. Cadets receive systematic and specific feedback on their leadership

values, attributes, skills, and actions. Open to ROTC cadets only. Prerequisite: MS-PC 3110. [3]

**MS-PC 4150. Leadership and Ethics.** [Formerly MS-PC 251] (Formerly MS 212) Students develops proficiency in planning, executing, and assessing complex operations, functioning as a member of a staff, and providing leadership-performance feedback to subordinates. Students are given situational opportunities to assess risk, make sound ethical decisions, and provide coaching and mentoring to fellow ROTC cadets. Open to ROTC cadets only. [3]

**MS-PC 4160. Leadership in a Complex World.** [Formerly MS-PC 252] (Formerly MS 252) This course explores the dynamics of leading in the complex situations of current military operations in the contemporary operating environment. It introduces the concept of culture, its components, how culture influences human behavior, the impact of culturally influenced behavior on military operations, and how to analyze and apply cultural considerations in the planning and execution of military operations. Open to ROTC cadets only. Prerequisite: MS-PC 4150. [3]

## Naval Science—Peabody

**NS-PC 2410. Organization and Management.** [Formerly NS 2410] This course presents a comprehensive study of organizational behavior and management with special emphasis on situational leadership in the military and civilian sectors and the development of your skills in organizational thinking and problem solving. You will explore a variety of leadership and management topics, including the classical theories of management, motivation and communication. FALL. [3]

**NS-PC 4242. Leadership and Ethics.** [Formerly NS-PC 2420] An exploration of major Western ethical philosophy in the development and application of leadership to enhance objective, sound and timely decision-making in the most challenging of environments. This course follows theoretical examination with case studies and practical application to emphasize the importance of ethical reasoning to leadership, and explores components of character and integrity in decision making. SPRING. [3]

## Psychology and Human Development

**PSY-PC 1001. Commons Seminar.** [Formerly PSY-PC 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

**PSY-PC 1115. First-Year Seminar.** [Formerly PSY-PC 1150] Topics of interest designed for first year students. Does not count in the writing requirement of the Liberal Education Core. [3]

**PSY-PC 1117. First Year Writing Seminar.** [Formerly PSY-PC 1157] Topics of interest for first year students. Courses are writing intensive and may be applied to the Peabody Liberal Education Core writing requirement. Repeatable with change of topic. [3]

**PSY-PC 1205. Minds, Brains, Contexts, and Cultures.** [Formerly PSY-PC 1200] An introduction to the cognitive studies major. Readings, lectures, and discussions are focused on thinking and understanding, especially as related to the brain, immediate context, and culture. These topics are considered from a variety of perspectives, including those taken from philosophy; literature; cognitive, social, and developmental psychology; sociology; psychiatry; and cultural anthropology. [3]

**PSY-PC 1207. Minds, Brains, Contexts, and Cultures.** [Formerly PSY-PC 1207] An introduction to the cognitive studies major. Readings, lectures, and discussions are focused on thinking and understanding, especially as related to the brain, immediate context, and culture. These topics are considered from a variety of perspectives, including those taken from philosophy; literature; cognitive, social, and developmental psychology; sociology, psychiatry; and cultural anthropology. May be applied toward the Peabody Liberal Education Core writing requirement. [3]

**PSY-PC 1250. Developmental Psychology.** [Formerly PSY-PC 1630] An overview of human development emphasizing the period from conception through adolescence. Course content includes research methods as well as in-depth coverage of selected topics in cognitive, social, emotional, and physical development. [3]

**PSY-PC 2110. Introduction to Statistical Analysis.** [Formerly PSY-PC 2101] Introductory course emphasizes selection, application, and interpretation of measures of relative frequency, location, dispersion, and association. Approaches to statistical inferences are emphasized. Prerequisite: proficiency in high school algebra. [3]

**PSY-PC 2120. Statistical Analysis.** [Formerly PSY-PC 2102] Second course in statistics for undergraduates. Multifactor analysis of variance designs (including repeated measures), and goodness of fit and contingency analyses. Prerequisite: PSY-PC 2110 or PSY 2100. [3]

**PSY-PC 2170. Experimental Research Methods in Child Development.** [Formerly PSY-PC 2510] Focuses on how experimental methods are used to understand processes of child development. Through readings, class discussion, writing, and research experiences, the class considers excellent examples of classic and contemporary experimental studies of child development. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200 and PSY 2100 or PSY-PC 2110. [3]

**PSY-PC 2200. Psychology of Thinking.** [Formerly PSY-PC 1600] An in-depth exploration of theories and basic research concerning how young adults (i.e., college students) think, reason, and solve problems. Major topics include memory, categorization, reasoning, decision making, problem solving, and expertise. Prerequisite: PSY-PC 1205/1207, or 2250 or PSY 1200. [3]

**PSY-PC 2230. Introduction to Educational Neuroscience.** Educational neuroscience (ed neuro) is an emerging scientific field that investigates how the brain enables learning. Ed neuro applies the methods of cognitive neuroscience to questions such as what are the brain systems that allow us to read and do math? How do those systems relate to general systems such as attention and memory? This course will provide an introduction to these topics and more, exploring the basics of how the brain is structured, to how we can use neuroimaging methods to understanding the brain structures and processes that support learning. At the end of this course you will have a basic understanding of cognitive neuroscience methods and how they relate to educationally relevant cognitive domains. [3]

**PSY-PC 2250. Cognitive Aspects of Human Development.** [Formerly PSY-PC 1500] Introduction to research and theory in cognitive development. Emphasis on infancy and on early and middle childhood. Topics may include development of language, memory, sensation and perception, problem solving, concepts and theories, effects of media, sociocultural support for development, developmental disorders, and logical mathematical reasoning. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200. [3]

**PSY-PC 2300. Social and Emotional Context of Cognition.** [Formerly PSY-PC 1700] An exploration of such social factors as the individual's values, beliefs, and emotions and their contributions to the basic cognitive processes involved in social perception, complex decision making, and problem solving. Topics include the social construction of perceived reality, attitude formation and change, heuristics and biases in social inference, and the role of emotion in coping and problem solving. [3]

**PSY-PC 2400. Social and Personality Development.** [Formerly PSY-PC 1750] An overview of basic concepts and current research in social and personality development. Specific topics include research methods, development of self, social cognition, achievement motivation, prosocial behavior, moral development, aggression, gender role development, family and cultural influences. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200. [3]

**PSY-PC 2500. Infancy.** [Formerly PSY-PC 2250] The behavior and physiological development of infants reflect a complex interaction between evolutionary history and genetics, prenatal environmental influences, and early postnatal experience. An overview of each of these topics is provided through classroom discussions and reading

assignments focusing on recent empirical studies and major theoretical issues. Prerequisite: PSY-PC 1250. [3]

**PSY-PC 2550. Adolescent Development.** [Formerly PSY-PC 2320] Examines theory, research, and other literature pertinent to the development and education of adolescents (ages 12–19). Specific topics include cognitive and social development; issues in identity, intimacy, autonomy, and sexuality; family-adolescent relationships; peer relationships; school achievement and organization; choices and decision making related to work. [3]

**PSY-PC 2560. Theories of Developmental Psychology in Practice.** We will study the grand theories of developmental psychology in-depth to provide a broad conceptual foundation for using developmental psychology in applied careers. Students will also gain familiarity with current developmental psychology concepts relevant to their intended professional practices. Through disciplined collaborative exchanges, students will learn about research advances and theoretical perspectives that are relevant to their fields, but not yet well known by practitioners. The term project assignments are designed to provide students the scholarly skills to not only keep up with current research in developmental psychology during their careers, but to seek out new domains of typical development research to learn from so that they can be leaders in their fields. For the final paper, students will write an original scholarly article to engage and inform practitioners. This closely supervised paper will provide students with individual practice using portable scholarly strategies to identify key developmental findings and communicate their importance to other practitioners. [3]

**PSY-PC 2600. Educational Psychology.** [Formerly PSY-PC 2310] Examines the applications of psychological theories and research to teaching and learning settings. Focuses on cognitive development, problem solving and critical thinking, learning theories, motivation, social contexts, individual differences, classroom issues, and evaluation issues. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200. [3]

**PSY-PC 3140. Psychology of Language.** This course covers the basics of the psychology of language, understanding the cognitive processes that underlie language production, language comprehension, and the use of language in society. Through understanding these processes, students will learn ways in which they can improve their own communication skills. [3]

**PSY-PC 3150. Language Development.** [Formerly PSY-PC 2000] An overview of language development with an emphasis on relevant research in linguistics, developmental psychology, and comparative psychology. Specific topics covered include research methods, speech perception, conversational competence, word learning, pragmatic development, and syntactic competence. The course is intended for students beyond the first year. [3]

**PSY-PC 3200. Introduction to Clinical Psychology.** [Formerly PSY-PC 2700] This course provides an overview of the science and practice of clinical psychology, with an emphasis on child and adolescent clinical psychology. Clinical research, psychological assessment, psychotherapy, and related issues will be discussed in class. Students examine the techniques used by clinical psychologists to assess and treat psychopathology, and research investigating the efficacy of these techniques. There is an emphasis on experiential learning in the class. Students will examine the science of clinical psychology by reviewing research from scientific journals on the effects of a specific type of psychotherapy for a specific psychological disorder. Previous courses in abnormal psychology and psychological research methods/statistics are highly recommended. [3]

**PSY-PC 3210. Hospitalized Child.** This course is designed for individuals who want to know more about the psychosocial needs of children, adolescents and families in health care settings and situations. Some of the specific topics covered in this course include: impact of illness and hospitalization on the family; social and developmental issues and how they interface with health care; normative development within the hospital; psychosocial roles of various health care team members; preparation of patients and families for health care experiences; utilizing play for therapeutic purposes; spirituality and its impact on the child and family's health care experience; the child who is dying; pediatric palliative and

hospice care; an introduction to the field of child life; and an introduction to the field of pediatric/family advanced practice nursing. [3]

**PSY-PC 3650. Advanced Topical Seminar.** [Formerly PSY-PC 2100] An advanced seminar intended for juniors and seniors in which a particular topic within cognitive studies is considered in depth. Topics vary. May be repeated for credit with change of topic. Prerequisite: PSY-PC 1200/1207 or 1250 or PSY 1200. This course is intended for students beyond the first year unless otherwise specified in the class schedule note. [3]

**PSY-PC 3722. Psychometric Methods.** [Formerly PSY-PC 2530] Covers the fundamental concepts of psychological measurement and testing, examines a sample of most important psychometric instruments in current use, provides observation of testing, and considers knowledge essential to making wise use of testing information in research and applied child development settings. Prerequisite: PSY-PC 1250 or 1205/1207 or PSY 1200 and PSY-PC 2110 or PSY 2100. [3]

**PSY-PC 3724. Psychometrics.** [Formerly PSY-PC 2540] The basic objectives of this course are for students to learn the fundamental concepts, methods, and principles of educational and psychological measurement. Particular attention will be devoted to reliability and validity issues underlying psychometric theory from original sources, and how psychometric theory relates to the assessment of individual differences or human psychological diversity more generally. Students should choose between PSY-PC 3722 and this course inasmuch as credit for both is not allowed. This course is more demanding in that students will be reading original sources; it is especially relevant to students seeking advanced training in the social sciences or research careers. Prerequisite: PSY-PC 2110 or PSY 2100 and PSY-PC 2120. [3]

**PSY-PC 3727. Modern Robust Statistical Methods.** [Formerly PSY-PC 2550] Covers modern statistical methods designed to handle violations of statistical assumptions that can compromise classic parametric procedures. More specifically, the student will learn about the classic assumptions of independence, normality, and equal variances that underlie many standard procedures, and become familiar with modern methods that perform vastly better than the classic procedures when assumptions are violated, yet offer few performance penalties under many realistic situations where assumptions are violated. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

**PSY-PC 3730. Applied Latent Class and Mixture Modeling.** [Formerly PSY-PC 2560] Often social science and educational researchers hypothesize that there are unobserved groups or latent classes of persons who show different behavioral patterns, or different patterns of change over time. This course covers mixture models - a statistical approach for assessing the number and size of classes, as well as class homogeneity or heterogeneity. Longitudinal mixture models are also used to allow classes to transition between states at different rates and/or to have different functional forms of change. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

**PSY-PC 3732. Latent Growth Curve Modeling.** [Formerly PSY-PC 2570] The analysis of longitudinal data (repeated measurements on the same people over time) is central for evaluating many theories in social science and educational research. This applied course will focus on one flexible and powerful approach for analyzing within individual change over time, and between individual differences in change: the latent growth curve model. Emphasis will be placed on applications to real data, interpretation of results, and attaining a solid understanding of the statistical model. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120 [3]

**PSY-PC 3735. Correlation & Regression.** [Formerly PSY-PC 2580] Covers modern correlation and regression techniques, including linear regression, multiple regression, polynomial regression, interaction effects, univariate and multivariate outlier detection, data transformation algorithms, handling of missing data, nonlinear regression, logistic regression, Poisson regression, variable selection procedures, and regression diagnostics and graphics. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

**PSY-PC 3738. Introduction to Item Response Theory.** [Formerly PSY-PC 2590] Students are introduced to the basic concepts of educational and psychological measurement, classical test theory (CTT), and item response theory (IRT). These concepts will be taught with practice by illustrating the construction of tests. Prerequisite: PSY-PC 2110 or PSY 2100 and PSY-PC 3722. [3]

**PSY-PC 3743. Factor Analysis.** [Formerly PSY-PC 2600] This course covers primarily Exploratory Factor Analysis (EFA), which is extensively used in psychology, education, medicine, and management to investigate the underlying dimensionality of unobserved constructs (e.g., intelligence, psychopathology). The theory behind factor analysis is covered alongside hands-on application to data, exposure to uses of factor analysis in the applied literature, and instruction in popular EFA software. Key topics include model specification, fit and evaluation, rotation methods, questionnaire development, sample size and power issues, and extensions to confirmatory factor models. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

**PSY-PC 3746. Multivariate Statistics.** [Formerly PSY-PC 2620] Provides an introduction to matrix algebra and a survey of the class parametric multivariate techniques that are the foundation of much of modern multivariate statistics. Emphasis is on techniques that have wide application in educational and social science research, such as exploratory factor analysis, structural equation modeling, confirmatory factor analysis, discriminant analysis, canonical correlation, and multivariate analysis of variance. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

**PSY-PC 3749. Applied Nonparametric Statistics.** [Formerly PSY-PC 2610] This course covers nonparametric statistical methods useful when the assumptions of ordinary parametric statistics are not met, and for developing custom statistical techniques useful when other methods do not exist. Coverage is given to distribution-free procedures, sign tests, contingency tables, median tests, chi-square and other goodness-of-fit tests, rank correlations, randomness tests, ordinal regression, Monte Carlo methods, resampling methods (bootstrap and jackknife), tests of independence, 1-sample, 2-sample, and k-sample methods, permutation tests, function smoothing, and splines. Emphasis is placed on underlying theory, application to data, and software. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

**PSY-PC 3850. Independent Study.** [Formerly PSY-PC 2970] Development of an independent study project by the individual student under the direction of a faculty sponsor. Intended primarily for juniors and seniors. Consent of both the faculty sponsor and the director of undergraduate studies is required. May be repeated for credit. [1-3]

**PSY-PC 3860. Directed Research.** [Formerly PSY-PC 2980] Participation in an empirical research project under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. May be repeated for credit. [1-3]

**PSY-PC 3870. Field Work in Psychology for Undergraduates.** [Formerly PSY-PC 2820] Offered to provide field experience appropriate to the student's interests. Open only to students majoring in child development, child studies, or cognitive studies. May be repeated. Consent of instructor required. [1-3]

**PSY-PC 3890. Special Topics in Psychology.** [Formerly PSY-PC 2690] Advanced exploration of a psychological orientation to current issues. May be repeated with change of topic. [1-4]

**PSY-PC 3980. Honors Seminar.** [Formerly PSY-PC 2990] Open only to junior-level students in the Department of Psychology and Human Development Honors Program. [1-3]

**PSY-PC 3981. Honors Seminar.** [Formerly PSY-PC 2990] Open only to junior-level students in the Department of Psychology and Human Development Honors Program. [1-3]

**PSY-PC 4998. Honors Thesis.** [Formerly PSY-PC 2990] Open only to senior-level students in the Department of Psychology and Human Development Honors Program. [1-3]

**PSY-PC 4999. Honors Thesis.** [Formerly PSY-PC 2990] Open only to senior-level students in the Department of Psychology and Human Development Honors Program. [1-3]

## Special Education

**SPED 1001. Commons Seminar.** [Formerly SPED 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

**SPED 1115. Freshman Seminar.** [Formerly SPED 1150] Selected Topics for first-year students [3]

**SPED 1175. Freshmen Seminar.** [Formerly SPED 1000] Provides students with an overview of the undergraduate program in special education. Faculty members from each program area share their experiences and research projects. Students complete a 15-hour service project with individuals with disabilities in the community. [1]

**SPED 1210. Introduction to Exceptionality.** [Formerly SPED 1010] Examines issues and trends in special education and overviews the characteristics of persons with disabilities. Covers essential issues and theories relating to special education and the development of exceptional persons with special attention to normal and atypical human development. Multi-cultural, humanistic, and legal issues are addressed. [3]

**SPED 2110. Introduction to Teaching Students with Disabilities.** [Formerly SPED 2010] This course consists of two major components. The first component focuses on special education law, writing IEPs, developing lesson plans, effective teaching behaviors, progress monitoring, and methods for grouping students. The second component provides an overview of instructional models that have empirical support for their effectiveness in teaching students with disabilities. [3]

**SPED 2160. Cultural Diversity in American Education.** [Formerly SPED 2060] (Also listed as EDUC 2160) Focuses on cultural diversity and the ways in which it has been defined and treated in the American educational system. An interdisciplinary perspective informs the course, with particular attention to history, sociology, psychology, anthropology, and educational literature. [3]

**SPED 2310. Managing Academic and Social Behavior.** [Formerly SPED 2110] This course is designed to prepare students to manage classroom behavior using behavioral principles. Definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress are presented. Emphasizes procedures for increasing academic and socially appropriate behavior through classroom activities. Students apply their skills in classroom settings. Prerequisite: SPED 1210. Corequisite: 1 hour of SPEDH 3871 or SPEDS 3871. [3]

**SPED 3240. Attention Deficit/Hyperactivity Disorder: Educational Implications.** [Formerly SPED 2140] This advanced undergraduate/masters level course will first address the issues and controversies surrounding the definition, etiology, and identification of Attention Deficit/Hyperactivity Disorder (AD/HD). Potential relationships or related issues involving other child characteristics or difficulties, including child temperament, depression, bipolar disorder, Tourette's Syndrome, and oppositional-defiant disorder, will be addressed. A major focus of the course will be working successfully with children with AD/HD in the school and classroom. A collaborative, multimodal model that involved parents, general and special education teachers, school psychologists, and other professionals as appropriate will be emphasized. Integration of multiple forms of intervention will be explored, including affective, behavioral, cognitive, social, and medical approaches; discovering what works for children with AD/HD is an ongoing process that requires experience, persistence, and collaboration. [3]

**SPED 3332. High Poverty Youth: Improving Outcomes.** [Formerly SPED 2080] (Also listed as HOD 2665) Youth from high poverty backgrounds often are placed at risk for a host of unfavorable outcomes

including academic failure, school dropout, drug abuse, unemployment, and incarceration. In this class, we will be working with schools and community agencies in Nashville to improve outcomes for youth living in high-poverty neighborhoods. We will have class meetings weekly as well as ongoing field-based experiences. Field work will include mentoring, tutoring, or providing job readiness training to youth in neighborhood community centers or in students' high schools. [3]

**SPED 3770. Accommodating Academic Diversity in the Classroom.** [Formerly SPED 2870] Explores the importance and difficulty of teaching heterogeneously grouped students in mainstream classrooms and offers specific instructional strategies for doing so effectively. Focuses explicitly and exclusively on methods to help classroom teachers instruct and manage the behavior of a broad range of students-students with and without disabilities at multiple points along the achievement continuum. [3]

**SPED 3850. Independent Study in Special Education.** [Formerly SPED 2960] Semi-independent study of selected topics in special education. May be repeated. Consent of instructor required. [1-3]

**SPED 3890. Special Topics in Special Education.** [Formerly SPED 2690] Study of selected topics or issues related to special education such as teaching culturally or linguistically diverse learners, accommodating academic diversity in classrooms, or augmentative communication techniques. May be repeated for credit with change in topic. [3]

**SPED 3980. Honors Seminar in Special Education.** [Formerly SPED 2990] This seminar is completed as part of the Honors Program in Special Education, which is designed to allow students experiences working with a faculty member on research activities. The course is taken during the junior year concurrent with engagement in research with a faculty mentor's team for at least five hours per week. During weekly meetings, students will be introduced to various research methodologies, read and discuss articles and studies that use a variety of research designs, examine and share their roles on a faculty mentor's team, and ultimately, complete and share an Honors Project at the end of the spring semester. Acceptance into the Honors Program and permission of the instructor are required. [0-1]

**SPED 4950. Student Teaching Seminar.** [Formerly SPED 2900] Students complete assignments and structured activities that demonstrate their ability to apply knowledge, skills, and dispositions acquired during the core courses and field-based experiences of the special education major. The weekly seminar discussion focuses on understanding situations and solving problems that naturally occur during the student teaching experience. Must co-register for either SPED 4954 or 4951 [3]

**SPED 4951. Student Teaching in Special Education.** [Formerly SPED 2911] Observation, participation, and classroom teaching for undergraduate students in any area of exceptionality. Placements are dependent on license areas. Prerequisite: Admission to student teaching. Corequisite: SPED 4950. [9]

**SPED 4954. Student Teaching in Special Education and Education.** [Formerly SPED 2901] (Also listed as EDUC 4954) Observation, participation, and classroom teaching for undergraduate students in any area of education combined with any area of exceptionality. Placements are dependent on license and endorsement areas. Prerequisite: Admission to student teaching. Corequisite: SPED 4950. [9]

## Gifted

**SPEDG 3324. Introduction to the Gifted Learner: Conceptions, Characteristics, and Assessment.** [Formerly SPED 2720] Examines issues and trends in gifted education with a focus on the specific needs and characteristics of gifted students. Outlines theoretical conceptions of giftedness and evidence-supported practices in identification and assessment - including those who may not be typically identified, such as twice-exceptional, low-income, and culturally diverse students. [3]

**SPEDG 3334. Psychology of the Gifted Learner.** [Formerly SPED 2730] Highlights internal and external factors impacting the psychological development of gifted students. Focuses on theoretical frameworks and practical strategies for the provision services, including consultation,

collaboration with schools and families, counseling supports, behavioral models, and collaboration with community agencies. [3]

**SPEDG 3344. Educating Gifted Students: Adaptations of Curriculum and Instruction.** [Formerly SPED 2740] Focuses on theoretical conceptions of curriculum development and instructional modifications for mild, moderate, and highly gifted students. Includes curriculum design theoretical frameworks, differentiation strategies, and how to measure the effects of adaptations to match gifted student learning needs. [3]

**SPEDG 3354. Organizational Structures and Planning of Gifted Programs.** [Formerly SPED 2750] Focuses on theoretical frameworks for organizing and implementing evidence supported programs for the gifted; service delivery models, program evaluation, data collection, supervision models, and systemic development of programming and support structures. Attention is also devoted to poverty and cultural differences. [3]

**SPEDG 3871. Practicum in Gifted Education.** [Formerly SPED 2760] Focuses on field study, action research, or practical application of course content for providing leadership, curriculum adaptations, and program planning for a variety of gifted learners including underrepresented populations and mild, moderate, and highly gifted individuals. [3]

## Interventionist/High Incidence/Modified

**SPEDH 3308. Understanding Students with Severe and Persistent Academic and Behavior Difficulties.** [Formerly SPED 2800] This course has three main components. The first component will focus on the cognitive, perceptual, language, academic, and social/emotional characteristics and needs of students with severe and persistent academic and behavior difficulties. The second component will focus on special education law and developing IEPs. The final component will focus on developing lesson plans and general strategies for teaching students with severe and persistent academic and behavior difficulties. Prerequisite: SPED 1210. [3]

**SPEDH 3318. Assessment for Students with Severe and Persistent Academic and Behavior Difficulties.** [Formerly SPED 2810] This course focuses on the diagnosis and evaluation of students with severe and persistent academic and behavior difficulties using a variety of developmentally appropriate curriculum based measurements, criterion-referenced, and norm-referenced tests in the academic and vocational subject areas. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives and instructional programming strategies. Specific considerations is given to the reporting of assessment information to parents, teachers and other support personnel to determine appropriate placement levels within the continuum of services. Prerequisite: SPED 1210. Corequisite: 1 hour of SPED 3871. [3]

**SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties: K-8.** [Formerly SPED 2820] This methodological course consists of two components. The first focuses on the possible causes for disabilities in the area of mathematics and assessment of those disabilities. The second emphasizes explicit teaching procedures, direct instruction, and instructional design principles that apply to teaching mathematics in grades K-8. Prerequisite: SPED 1210 and 3308. [3]

**SPEDH 3338. Teaching Reading to Students with Severe and Persistent Academic and Behavior Difficulties.** [Formerly SPED 2830] Presents empirically validated instructional procedures to address the reading deficits of students with severe and persistent academic and behavior difficulties. Integration of explicit teaching procedures, direct instruction, and instructional design principles that apply to a range of academic domains are emphasized. Proficiency in the development of assessment profiles, instructional lessons, monitoring of progress through curriculum-based measures and data-based decision making is required. Candidates apply skills in classroom settings. Prerequisite: SPED 1210 and 3308. Corequisite: 1 hour of SPED 3871. [3]



**SPEDH 3348. Language and Learning.** [Formerly SPED 2840] This course examines writing and language development, the written and language difficulties encountered by students with high incidence disabilities, assessment and instruction of writing and language difficulties, as well as cultural diversity and writing and language differences. [3]

**SPEDH 3358. Advanced Reading Methods for Students with Severe and Persistent Academic and Behavior Difficulties.** [Formerly SPED 2850] This course focuses on advanced methods of assessment and instruction methods related to teaching reading. Candidates in this course will gain competency in using formative assessments to identify students with severe and persistent reading difficulties, as well as expertise in and knowledge of teaching approaches and curricula for improving decoding, vocabulary, fluency, and comprehension abilities. Prerequisite: SPED 1210 and 3338. Corequisite: 1 hour of SPED 3871. [3]

**SPEDH 3368. Teaching Middle School Students with Severe and Persistent Academic and Behavior Difficulties.** This middle school course for teaching students with severe and persistent academic and behavior difficulties has two components. The first focuses on teaching English Language Arts across the curriculum at the middle school, including reading literature and informational text, language development, writing, speaking, and listening. The second component focuses on skills needed for collaborating with other school personnel and preparing students to transition to high school. [3]

**SPEDH 3378. Teaching High School Students with Severe and Persistent Academic and Behavior Difficulties.** This is an introductory course in teaching students with severe and persistent academic and behavior problems at the high school setting. The first half of the course covers models of teaching special education at the secondary level, transition-related legislation, post-school outcomes of high school students with disabilities, and dropout prevention within a context of cultural diversity. The second half focuses on empirically-based secondary special education strategies, including academic/study skills and accommodations, social skills, self-determination, ITP development, and career education and employment. [3]

**SPEDH 3388. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties 6-12.** This mathematics methods course for teaching 6-12th grade students with severe and persistent academic and behavior difficulties consist of two major components. The first component focuses on the possible causes of math disabilities and assessment of math disabilities. The second component emphasizes instructional design principles, explicit teaching procedures, interventions, and mathematics pedagogy at the secondary level. [3]

**SPEDH 3777. School and Classroom Supports Teaching Students Academic Behavior Difficulties.** [Formerly SPED 2877] This course focuses on practices to support teaching and learning of students with severe and persistent academic and behavior difficulties. Core topics include the following: (1) Effective classroom management to enhance appropriate behavior, prevent problem behavior, and support students at-risk for and with behavior difficulties; (2) Research, efficacy and models of co-teaching; (3) Collaboration with colleagues and families; (4) Technology use to support instruction and accessibility; and (5) Ethical professional behavior. [3]

**SPEDH 3871. Field Work in Special Education for Mild/Moderate Disabilities.** [Formerly SPED 2801] Field-based application of correlated course content to classroom strategies. Planning, implementation, and evaluating instructional procedures for students with mild to moderate disabilities. May be repeated. Prerequisite: SPED 1210 and SPED 2110. Fall semester corequisite: SPED 2310, SPEDH 3338 and 3348. Spring semester corequisite: SPEDH 3318, 3328, and 3368. [3].

## Severe/Comprehensive

**SPEDS SPEDS 2120. Family Intervention.** [Formerly SPED 2020] An overview of different approaches, current issues, and problems involved in working with and supporting families. Emphasis is placed on how a child with disabilities affects and is affected by parents, siblings, the extended family, and the community. Strategies for effective

communication for the purpose of information sharing and collaborative planning with families are provided. [3]

**SPEDS 2430. Introduction to Language and Communication.** [Formerly SPED 2030] Overview of normal language development, psycholinguistic terminology and research, speech and language disorders and their remediation, and specific intervention procedures for the development of speech and language skills in children and youth. [3]

**SPEDS 2450. Augmentative and Alternative Communication.** [Formerly SPED 2050] This course is designed to provide an overview of the field of augmentative and alternative communication (AAC) for use with young children and school-age children with severe disabilities. Specifically, the course will provide an overview of the theories that are important to the understanding of appropriate uses of AAC systems, and the course will provide information about the efficacy of these systems with students with severe disabilities. Topics will include guidelines for selecting, implementing, using, and monitoring the use of AAC systems. [3]

**SPEDS 3300. Methods of Instruction for Students with Severe and Multiple Disabilities.** [Formerly SPED 2300] Provides information on the nature and needs of individuals with severe disabilities and the roles of federal, state, and local agencies in providing services to this population. Emphasis is placed on strategies for the acquisition and generalized use of age appropriate functional skills in natural community-based settings. Methods for developing and implementing individualized programming across specialized curricular areas such as communicative, cognitive, functional academic, motor, domestic living/self-help, recreation/leisure, vocational and general community living skills. Must co-register for SPEDS 3871. [3]

**SPEDS 3312. Procedures in Transition to Adult Life.** [Formerly SPED 2340] (Also listed as HODC 3312) Overview of history, legislation, and practice in the areas of community and employment integration for persons with disabilities. Emphasis on various strategies for promoting a successful transition from school to life. Students are required to develop instructional plans for integration within the community. Students will apply their skills in community or classroom settings. Prerequisite: SPED 2310. Corequisite: SPEDS 3871. [3]

**SPEDS 3330. Characteristics of Students with Severe and Multiple Disabilities.** [Formerly SPED 2330] This course provides information on the history, nature, characteristics, and needs of students with exceptionalities. Neurological impairments resulting in motor dysfunction, sensory impairments, and the combination of these are discussed. Information is provided on the physical, medical, and educational management of students with severe, profound, and multiple disabilities in educational settings. Corequisite: SPEDS 3871. [3]

**SPEDS 3350. Access to General Education and Teaching Functional Academics.** [Formerly SPED 2350] The course provides in-depth information on teaching students with severe disabilities. Emphasis is on strategies for the acquisition and generalized use of age-appropriate functional skills in natural school and community-based settings. Methods for developing and implementing individualized programming across specialized curricular areas such as communicative, cognitive, functional academic, motor, domestic living/self-help, recreation/leisure, and general community living skills. Current research evidence to support effective practices is stressed. [3]

**SPEDS 3661. Fieldwork in Special Education: Severe Disabilities.** Students will participate in field-work in special education, specifically in classrooms for students with severe exceptionalities and/or autism. Students will complete activities tied to a fieldwork in special education seminar. This course may be repeated. Corequisite: SPEDS 3667. Prerequisite SPED 3871 both fall and spring. [2]

**SPEDS 3667. Seminar in Severe Disabilities Fieldwork.** Seminar for undergraduate students related to their field-work in local classrooms with severe disabilities and/or autism. Students will complete various assignments and implement them in a classroom setting. This course may be used to satisfy the Peabody College writing requirement. Prerequisite: SPED 1210, 2120, 2450, SPEDS 3300, 3330, 3312, 3350. Corequisite: SPEDS 3661. [3]

**SPEDS 3871. Field Work in Special Education: Autism, Intellectual, and Multiple Disabilities.** [Formerly SPED 2311] Field-based application of correlated course content to classroom strategies. Planning, implementation, and evaluating instructional procedures for students with severe disabilities. May be repeated. Prerequisite: SPED 1210, SPED 2110, SPED 2430. Fall semester corequisite: SPED 2310, and SPEDS 3330. Spring semester corequisite: SPED 2450, SPEDS 3312, and SPED 3328. [3]

## Visual Impairment

**SPEDV 3305. Medical and Educational Implications of Visual Impairments.** [Formerly SPED 2500] Assessment of sensory function, including integration of information from medical rehabilitation vision care specialists, as basis for planning, implementing, and monitoring intervention/education for learners with visual impairments. Emphasis is on specific visual disorders, functional use of senses, assistive technology for enhancing visual function (i.e., optical and non-optical devices), and family/child characteristics. Linking structure/function of the visual system to most prevalent visual conditions, identifying implications of conditions for development and learning, and identifying appropriate accommodations for optimizing visual function. Roles of teacher of students with visual impairments; medical, educational, and rehabilitation professionals; families; and other team members in optimizing outcomes for students with visual impairments. Content provided through lectures, demonstrations, observations, laboratory dissections, and integrated fieldwork. [3]

**SPEDV 3315. Educational Procedures for Students with Visual Impairments.** [Formerly SPED 2510] Introduction to the literature, history, principles, programs, practices, and problems in the field of visual impairment/blindness. Role of teacher of students with visual impairments in providing access to the general core curriculum, providing instruction in the expanded core curriculum for students with visual impairments, and introduction to assistive technology. Using assessment and data driven decision making to guide intervention planning, implementation, and progress monitoring. Course content provided through lectures, demonstrations, observations, and integrated fieldwork. [3]

**SPEDV 3335. Braille Reading and Writing.** [Formerly SPED 2530] Literary braille code and introduction to Nemeth code for mathematics. Braille writing and reading proficiency for future teachers of students with visual impairments. Introduction to strategies for infusing braille into literacy instruction and technology for producing and accessing braille. Students read, write, and proofread braille and observe teachers as they teach braille to students with visual impairments. [2]

**SPEDV 3345. Communication and Literacy Skills for Students with Visual Impairments.** [Formerly SPED 2540] Promoting/teaching communication and literacy skills, including use of assistive technology for communication and literacy (augmentative communication devices, computer-assisted instruction, keyboarding skills, non-optical devices for enhancing reading and writing, etc.) for students with visual impairments, including those with multiple disabilities. Special emphasis on learning media assessments; assessment of communication and literacy skills for intervention planning, implementation, and program monitoring; accessibility and production of appropriate learning media. Open only to individuals who have completed or are currently enrolled in a braille class. Course content provided through lectures, demonstrations, observations, and integrated fieldwork. Consent of instructor required. [3]

**SPEDV 3355. Orientation and Mobility for Teachers of Students with Visual Impairments.** [Formerly SPED 2550] Lectures, discussions, and simulated activities in teaching orientation, mobility concepts and skills to students with visual impairments. Impact of visual impairment on motor and cognitive development and strategies for promoting optimal development and learning, sensory use, and independent travel, including assistive technology. Taught by an orientation and mobility specialist. Course content provided through lectures, demonstrations, observations, and integrated fieldwork. [3]

**SPEDV 3385. Advanced Procedures for Students with Visual Impairments.** [Formerly SPED 2580] Advanced strategies for providing access to the general core curriculum and providing instruction in the

expanded core curriculum for students with visual impairments, early intervention and family-centered practices, with particular emphasis on assistive technology and universal design for learning. Course content provided through lectures, demonstrations, observations, and integrated fieldwork. Prerequisite: SPEDV 3315. [3]

## Teaching and Learning

### Education

**EDUC 1001. Commons Seminar.** [Formerly EDUC 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

**EDUC 1220. Society, the School, and the Teacher.** [Formerly EDUC 1020] Introduces the relationship between society's goals and those of the school. Studies the community setting and the school, the social, political, and instructional organization of a school, and the roles and values of a teacher. Field experience. [3]

**EDUC 2160. Cultural Diversity in American Education.** [Formerly EDUC 2060] (Also listed as SPED 2060) Focuses on cultural diversity and the ways in which it has been defined and treated in the American educational system. An interdisciplinary perspective informs the course, with particular attention to history, sociology, psychology, anthropology, and educational literatures. [3]

**EDUC 3114. Language and Literacy Learning in Young Children.** [Formerly EDUC 2115] Examines sociocultural and cognitive theories of language learning, theoretical models of the reading and writing processes, and interconnections between reading, writing, speaking, and listening. Emphasizes patterns of reading and writing for children from birth to age 8 and relates these to features of learning environments. Observation and assessment strategies are introduced through an embedded field experience of six hours which requires working with preschool-age child in a school setting. [3]

**EDUC 3115. Methods of Language and Literacy Instruction in Early Childhood.** [Formerly EDUC 2117] This course introduces methods for structuring classrooms to teach and assess reading, writing, speaking, and listening as part of an integrated language arts program for children from birth through grade 4, with special emphasis on children from birth to age 8. Corequisite: EDUC 3116 [3]

**EDUC 3116. Practicum in Teaching Early Childhood Reading and Language Arts.** [Formerly EDUC 2116] Field experiences in a variety of early childhood centers or classroom settings designed to provide practical experience and reflection on the teaching of reading and the language arts. Corequisite: EDUC 3115. [1]

**EDUC 3120. Children in Families and Schools.** [Formerly EDUC 2120] Examines the cultural, social-political, historical, and collaborative influences of families and educational institutions on children's development and learning. Emphasis on understanding family-school connections and developing partnerships to foster maximum growth of children. [3]

**EDUC 3140. Learning and Development in Early Childhood Education.** [Formerly EDUC 2140] Applying an understanding of learning and development, students examine a variety of early childhood curriculum models based upon their assumptions about learning and development. Students consider how the role of the classroom teacher and the establishment of classroom norms are shaped by each curricular model. An imbedded 20-hour practicum enables students to see different curricular models and to interact with preschool children. [3]

**EDUC 3150. Science and Social Studies Instruction in Early Grades.** [Formerly EDUC 2150] This course is designed to prepare prospective early childhood teachers to provide instruction in science, and social studies. The course builds on the core content course in science and social studies in the early childhood program as well as the curriculum

courses for ages 0-3 and age 3-kindergarten. Prerequisite: SSED 2100. Corequisite: MTED 3150 and EDUC 3151. [3]

**EDUC 3151. Practicum in Mathematics, Science, and Social Studies Instruction in Early Grades.** [Formerly EDUC 2151] Field experiences in an early grades classroom are designed to provide practical experience and reflection on the teaching of mathematics, science, and social studies. Corequisite: EDUC 3150 and MTED 3150. [1]

**EDUC 3180. Managing Instructional Settings for Young Children.** [Formerly EDUC 2180] The purpose of this course is to introduce students to the social and emotional characteristics of young children that affect the ways they function in groups, and to acquaint students with planning and management philosophies and a variety of practices to use in guiding the behaviors of young children, from infancy through age 8. [2]

**EDUC 3212. Introduction to Reading Processes and Assessment.** [Formerly EDUC 2430/2212] Develops an understanding of reading and of elementary students as readers. Examines theoretical models, approaches, and the development of reading in elementary classrooms. Candidates will investigate how children learn to read, explore assessments that reveal student understanding of reading, and apply this knowledge in scaffolding reading with individual students. Provides informal assessment and teaching experiences within a school setting. [3]

**EDUC 3214. Theory and Methods of Reading Instruction in Elementary Schools.** [Formerly EDUC 2215] Examines approaches, strategies, and methods for teaching reading in elementary classrooms with attention paid to philosophies and principles of instructional practice designed to individualize instruction and support literacy development. Discusses underlying concepts and theories pertaining to literacy instruction and relates these to classroom practice. Although grounded in the philosophy that reading and writing are not discrete entities, the course focuses on reading. Prerequisite: EDUC 3212. Corequisite: EDUC 3215 and EDUC 3216. [3]

**EDUC 3215. Language Arts in Elementary Schools.** [Formerly EDUC 2217] Examines the nature of language development in the elementary school years with attention paid to principles and practices for teaching English language arts, particularly related to writing instruction. Consideration of instructional practices designed to individualize instruction and support literacy development will occur. Prerequisite: EDUC 3212. Corequisite: EDUC 3214 and EDUC 3216. [3]

**EDUC 3216. Practicum in Teaching Elementary Reading and Language Arts.** [Formerly EDUC 2216] : Field experiences in a variety of elementary classroom settings designed to provide practical experience and reflection on the teaching of reading and the language arts. Prerequisite: EDUC 3212. Corequisite: EDUC 3214 and EDUC 3215. [1]

**EDUC 3240. Practicum in Elementary Science and Social Studies.** [Formerly EDUC 2210/2240] Field experiences in a variety of school, grade level, and instructional settings, designed to integrate and apply teaching skills developed in the elementary science and social studies methods courses. Corequisite: SCED 3240 and SSED 3240. [1]

**EDUC 3270. Managing Instructional Settings.** [Formerly EDUC 2270] Examines several planning and management philosophies and a variety of practices for use with early childhood and/or elementary school students. [2]

**EDUC 3310. Classroom Ecology.** [Formerly EDUC 2310] This course explores how teachers make design choices for an environment that creates optimal conditions for student learning. Design elements include social and cultural contexts of learning, social/emotional learning, motivations for learning, and appropriate assessments. This is an introductory general methods class. Students will take specific methods classes in their area of teaching. [3]

**EDUC 3620. Social and Philosophical Aspects of Education.** [Formerly EDUC 2920] Exploration of the interaction between contemporary social problems and various philosophies in relation to educational theory, policy, and practice. [3]

**EDUC 3720. Principles for Teaching English Language Learner Students.** [Formerly EDUC 2520] This course, specifically designed for

non-ELL majors, provides an overview of theoretically and empirically supported practices concerning the education of English language learners (ELLs) in grades PreK-12. Topics include: the role of second language acquisition in academic achievement, instructional strategies for developing English listening, speaking, reading and writing while accessing the core curriculum, appropriate assessment of ELLs in the classroom, the importance of ELLs home language and culture, and ESL research and history relating to policies and programs affecting ELLs. Consideration of how to attain more equitable outcomes for ELLs through schooling is a major focus of this course. [3]

**EDUC 3730. English Language Learner Educational Foundations.** [Formerly EDUC 2530] This course focuses on understanding the processes of second language acquisition, learning, development, and individual, cognitive, and social factors that influence second language learning in North America (particularly in the United States). In addition, it examines the theoretical, historical, political, legal, and research bases for the education of students from linguistically and culturally diverse populations. Program models and the theoretical bases for these models are covered in this course. National policies and current issues relevant to the learning of English language learners are emphasized. Corequisite: 1 hour of EDUC 3731 [3]

**EDUC 3731. Practicum for Teaching English Language Learners I.** [Formerly EDUC 2571] A fieldbased practicum working with students who are English language learners. Experience will include use of students' native languages and/or ESL instructional components. Corequisite EDUC 3730. [1]

**EDUC 3740. English Language Learner Methods and Materials.** [Formerly EDUC 2540] This course focuses on bilingual (native language and ESL) curriculum development and instruction for students (preK-12) in a variety of language and program settings. Second-language instructional theory and practice, materials selection and development for LEP children, and bilingual and ESL literacy and content area instruction (mathematics, science, social studies, and English education) are covered. Frameworks for evaluating curriculum materials and their instructional recommendations for ELL students are provided. Corequisite: 1 hour of EDUC 3742. [3]

**EDUC 3742. Practicum for Teaching English Language Learners II.** [Formerly EDUC 2572] A field-based practicum working with students who are English language learners. Experience will include use of students' native languages and/or ESL instructional components. Corequisite EDUC 3740. [1]

**EDUC 3750. Linguistics and Language Acquisition for English Language Learner Teachers.** [Formerly EDUC 2550] This course focuses on the applying of theories of linguistics and second language acquisition to the teaching of English language learners. Topics covered include the structure of the English language, English as a system, language acquisition and development, language variation, and theories of second language acquisition. [3]

**EDUC 3760. Assessment of English Language Learners.** [Formerly EDUC 2560] This course focuses on the theoretical and practical aspects of language testing for second-language learners. Instruments used by educators to assess the language proficiency and academic achievement of linguistically diverse students are presented and demonstrated. The course examines the purposes and types of language tests in relation to theories of language use and language teaching goals; discusses testing practices and procedures related to language teaching and language research; and includes the planning, writing, and administration of tests, basic descriptive statistics, and test analysis. Rubrics for relating assessment information to instruction and program planning are developed within this course. Corequisite: 1 hour of EDUC 3763 [3]

**EDUC 3763. Practicum for Teaching English Language Learners III.** [Formerly EDUC 2573] A field-based practicum working with students who are English language learners. Experience will include use of students' native languages and/or ESL instructional components. Corequisite: EDUC 3760. [13]

**EDUC 3850. Independent Study in Education.** [Formerly EDUC 2960] Semi-independent study on selected topics in education. Consent of instructor required. May be repeated. [1-3]

**EDUC 3860. Honors Research in Education.** [Formerly EDUC 2980] Individual programs of reading on the conduct of research studies in education. May be repeated. Consent of instructor required. [1-3]

**EDUC 3861. Initial Fieldwork in Educational Studies.** Field-based application of Education Studies coursework, providing students an opportunity to integrate and apply theory and practice to learning in out-of-school settings. Students are placed in culturally diverse education settings and are given opportunities to engage in practitioner observations, learning design and implementation, and guided reflective practice. [3]

**EDUC 3862. Advanced Fieldwork in Educational Studies.** Advanced experience for Education Studies coursework, providing students an opportunity to develop independent experience in out-of-school settings and to apply at an advanced level theory and practice to learning in out-of-school settings. Students are placed in culturally diverse education settings and are given opportunities to engage in practitioner observations, learning design and implementation, and guided reflective practice. [3]

**EDUC 3871. Practicum in Secondary Education I.** [Formerly EDUC 2340] Field experience in middle and secondary school settings. Designed for secondary education majors in their sophomore year. Corequisite: PSY-PC 2550 [1]

**EDUC 3872. Practicum in Secondary Education II.** [Formerly EDUC 2350] Field experience in middle and secondary school settings. Designed for secondary education majors in their junior year. [1]

**EDUC 3890. Special Topics in Education.** [Formerly EDUC 2690] Exploration of special issues on topics related to education. May be repeated for credit with change of topic. [1-3]

**EDUC 4950. Capstone Fieldwork in Educational Studies.** Capstone experience for Education Studies coursework, providing students an opportunity to develop independent experience in out-of-school settings and to apply at an advanced level theory and practice to learning in out-of-school settings. Students are placed in culturally diverse education settings and are given opportunities to engage in practitioner observations, learning design and implementation, and guided reflective practice. Capstone experiences should include opportunities for students to develop, direct or implement learning opportunities with increasing independence from field partners. [6]

**EDUC 4951. Student Teaching in Early Childhood.** [Formerly EDUC 2702] Observation and teaching experience for students seeking PreK-3 licensure. Undergraduate credit only. Prerequisite: Admission to student teaching. [9]

**EDUC 4952. Student Teaching in the Elementary School.** [Formerly EDUC 2701] Observation and teaching experience in elementary schools. Undergraduate credit only. Prerequisite: Admission to student teaching. [9]

**EDUC 4953. Student Teaching in the Secondary School.** [Formerly EDUC 2703] Observation and teaching experience in secondary schools. Undergraduate credit only. Prerequisite: Admission to student teaching. [9]

**EDUC 4954. Student Teaching in Education and Special Education.** [Formerly EDUC 2704] (Also listed as SPED 4954) Observation, participation, and classroom teaching for undergraduate students in any area of education combined with any area of exceptionality. Placements are dependent on license and endorsement areas. Prerequisite: Admission to student teaching. [9]

**EDUC 4961. Student Teaching Seminar: Early Childhood.** [Formerly EDUC 2291] Seminar to accompany EDUC 4951. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

**EDUC 4962. Student Teaching Seminar: Elementary.** [Formerly EDUC 2290] Seminar to accompany EDUC 4952. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

## English Education

**ENED 2100. Literature and Drama for Young Children.** [Formerly ENED 2100] Explores characteristics of good literature (with a particular focus on picture books and poetry) for children ages birth to ten, authors and illustrators of the genre, and issues in the area of literature for young children. Also explored is the study of drama as it impacts the development of young children. [3]

**ENED 2200. Exploring Literature for Children.** [Formerly ENED 2200] Explores characteristics of good literature for children ages birth to 12, authors and illustrators of the genre, and issues in the area of children's literature. [3]

**ENED 2430. Fostering Language in Diverse Classrooms.** [Formerly ENED 2030] Overview of language learning, emphasizing ages 3 - 8 and the role of teachers and parents in fostering growth. Variability associated with culture, income, home language and individual child characteristics is examined from developmental and sociolinguistic perspectives. Students examine language use and teaching as part of an 8 hour practicum in an early childhood classroom. [3]

**ENED 3310. Language Study in the Secondary Classroom.** [Formerly ENED 2280] Investigates various methods of approaching grammar, vocabulary spelling, semantics, and bi-dialectism in the English classroom. For teachers and prospective teachers of middle school and high school English. [3]

**ENED 3340. Reading and Learning with Print and New Media.** [Formerly ENED 2320] Studies print and technology-based approaches to improving reading and content area learning in grades 6-12 with a special emphasis on diverse learners and struggling readers. Drawing on research-based practice, students learn to design, enact, and assess effective reading and literacy instruction. [3]

**ENED 3350. Literature, Popular Culture, and New Media.** [Formerly ENED 2920] Examines a wide range of multigenre, multimodal, and digital texts appropriate for readers of middle school and high school age. Considers the influence of popular culture and digital technologies on young adult literature. Includes materials and texts for readers of various ability levels. [3]

**ENED 3370. Teaching Literature and New Media in the Secondary School.** [Formerly ENED 2370] Students study how pedagogy might be developed that connects traditional literature instruction with media popular cultural media. Methods and theories for reading and teaching short stories, poetry, and novels are juxtaposed and interwoven with methods and theories for reading and teaching web sites, comics, film, and other media. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: ENED 3371. [3]

**ENED 3371. Practicum in Secondary Education III.** [Formerly ENED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite: ENED 3370 [1]

**ENED 3380. Teaching Writing in Secondary Schools.** [Formerly ENED 2380] Designed to encourage student teachers to examine the complexities of teaching writing in middle and high school settings and to develop a theoretically sound methodology that will allow them to design meaningful, engaging, and thoughtful writing instruction. [3]

**ENED 3400. Harry Potter and Children's Literature.** Students will examine British Literature related to J.K. Rowling's novels. Students will be asked to relate what they learn from other children's literature to the characters, plot, and themes of the Harry Potter novels as well as the opportunity to perform a variety of critical analyses of a social/cultural phenomena with progressive young adult literature. Additionally, students will explore the film versions of all novels discussed to analyze and critique the adaptations. This is a weekend course that includes week-long travel to the United Kingdom where students will engage

in the stories in an experiential journey of local UK sites, studios, and museums. [3]

**ENED 3410. Literature of Social Transformation.** Historical events, issues, and movements are often explored in literature for children and adolescents. The literature helps make history come alive. This class will focus on stories relating to the civil rights movement that led to social transformation the United States. In this weekend course, students will explore books written for children/young adults, discuss specific episodes of the movement where youth had great impact, and visit libraries, museums, and related sites. [3]

**ENED 3850. Independent Study in English Education.** [Formerly ENED 2960] Semi-independent study on selected topics in English education. Consent of supervising instructor required. May be repeated. [1-3]

**ENED 3890. Special Topics in English Education.** [Formerly ENED 2690] Exploration of special topics related to English education. May be repeated with change of topic. [3]

**ENED 4963. Student Teaching Seminar: Secondary.** [Formerly ENED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

## Foreign Language Education

**FLED 3850. Independent Study in Foreign Language Education.** [Formerly FLED 2960] Semi-independent study on selected topics in foreign language education. May be repeated. Consent of instructor required. [1-3]

**FLED 3890. Special Topics in Foreign Language Education.** [Formerly FLED 2690] Exploration of special issues or topics related to foreign language education. May be repeated for credit with change of topic. [1-3]

## Humanities Education

**HMED 2150. Arts Education for Young Children.** [Formerly HMED 2150] This course is designed to acquaint the early childhood teacher with concepts, techniques, and materials for creating opportunities for young children to learn about the visual arts and music. Strategies for incorporating art activities into group settings will be explored, as well as accommodating individual differences in young children's interest in and responsiveness to the arts. [2]

**HMED 2250. Introduction to Arts Education.** [Formerly HMED 2250] Acquaints the student with the philosophical and pedagogical base with which to develop competence in teaching the arts. [2]

**HMED 3850. Independent Study in Humanities Education.** [Formerly HMED 2960] Semi-independent study on selected topics in humanities education. May be repeated. Consent of faculty supervisor required. [1-3]

**HMED 3890. Special Topics in Humanities Education.** [Formerly HMED 2690] Explores special topics related to humanities education. May be repeated with change of topic. [1-3]

## Mathematics Education

**MTED 2100. Young Children's Mathematical Thinking and Learning.** [Formerly MTED 2100] The focus of the course is on ways in which young children develop increasingly sophisticated additive structures, including pre-number and early number concepts, place value, strategies for single- and double-digit computation, and measurement. Children's mathematical thinking and learning as well as ways to support that learning are investigated. This course is prerequisite to or corequisite with EDUC 3150. This course is not recommended for freshmen. [3]

**MTED 2200. Mathematics for Elementary Teachers.** [Formerly MTED 2200] This course is for students seeking elementary school licensure with an emphasis on grades two through six. This course will cover issues of both content and pedagogy that are relevant to these grades. Not recommended for freshmen. This course is prerequisite to MTED 3250. [3]

**MTED 3150. Mathematics Instruction in the Early Grades.** [Formerly MTED 2150] This course is designed to prepare prospective early childhood teachers to provide instruction in mathematics. The course builds on the core content course in mathematics in the early childhood program as well as the curriculum courses for ages 0-3 and age 3-kindergarten. Prerequisite: MTED 2100. Corequisite: EDUC 3150 and EDUC 3151. [2]

**MTED 3250. Teaching Mathematics in Elementary Schools.** [Formerly MTED 2250] This course is the second in a sequence of courses designed for those students seeking elementary licensure with an emphasis on grades 2-5. This course deals with issues of both content and pedagogy that are relevant to these grades. Corequisite: MTED 3251. Prerequisite: MTED 2200. [2]

**MTED 3251. Practicum in Elementary Mathematics.** [Formerly EDUC 2250/MTED 2251] Field experiences providing students an opportunity to integrate and apply teaching skills developed in the elementary mathematics course. Students are placed in a local elementary school classroom and are given opportunities to engage in classroom observations, curriculum planning and implementation, and guided reflective practice. Corequisite: MTED 3250 [1]

**MTED 3320. Introduction to Literacies in Mathematics.** [Formerly MTED 2690] This course is intended for licensure candidates in secondary education for mathematics and for other students who want to explore the concepts and practices of disciplinary literacy that is the links between content and communication. [3]

**MTED 3360. Computers, Teaching, and Mathematical Visualization.** [Formerly MTED 2800] Examining the 7-14 mathematics curriculum as a body of ideas that students can develop over time and the use of computer environments to support teaching and learning them. [3]

**MTED 3370. Teaching Mathematics in Secondary Schools.** [Formerly MTED 2370] Study of conceptual structure, curriculum, objectives, instructional approaches, materials, learning theory, and philosophies of assessment as they relate to teaching mathematics in middle and secondary schools. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: MTED 3371. [3]

**MTED 3371. Practicum in Secondary Education III.** [Formerly MTED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite: MTED 3370 [1]

**MTED 3850. Independent Study in Mathematics Education.** [Formerly MTED 2960] Semi-independent study on selected topics in mathematics education. May be repeated. Consent of supervising instructor. [1-3]

**MTED 3890. Special Topics in Mathematics Education.** [Formerly MTED 2690] Exploration of special topics related to mathematics education. May be repeated with change of topic. [1-3]

**MTED 4963. Student Teaching Seminar: Secondary.** [Formerly MTED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

## Science Education

**SCED 2200. Science for Elementary Teachers.** [Formerly SCED 2200] This course is designed to examine the relationship between science, technology, and society. Emphasis will be on relating science concepts to real world applications, to societal influences and the changing nature of science. The role of inquiry in science will be examined and experienced. A knowledge of introductory earth, biological, and physical science is presumed and will be utilized to present a view of science as an integrated discipline. [3]

**SCED 3240. Teaching Science in Elementary Schools.** [Formerly SCED 2250/2240] Study of the nature of science, discovery (inquiry) teaching and learning, curriculum approaches, goals and standards, trends, instructional and assessment strategies, and resources and materials for teaching science in grades K-5, with emphasis on grades 2-5. Prerequisite: SCED 2200. Corequisite: SSSED 3240 and EDUC 3240. [2]

**SCED 3320. Introduction to Literacies in Science.** [Formerly SCED 2690] This course is intended for licensure candidates in secondary science education and for other students who want to explore the concepts and practices of disciplinary literacy, that is, the links between content and communication. [3]

**SCED 3370. Teaching Science in Secondary Schools.** [Formerly SCED 2370] Study of instructional approaches, materials, curriculum resources, trends, inquiry teaching and learning, for teaching in secondary schools. Required for secondary school licensure in the sciences. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: SCED 3371. [3]

**SCED 3371. Practicum in Secondary Education III.** [Formerly SCED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite SCED 3370 [1]

**SCED 3400. Modeling in the Secondary Science Classroom.** This course is intended for licensure candidates in secondary science education and for other students who want to explore modeling in the secondary science classroom. [3]

**SCED 3850. Independent Study in Science Education.** [Formerly SCED 2960] Semi-independent study on selected topics in science education. May be repeated. Consent of supervising instructor required. [1-3]

**SCED 3890. Special Topics in Science Education.** [Formerly SCED 2690] Exploration of a special topic related to science education. May be repeated with change of topic. [1-3]

**SCED 4963. Student Teaching Seminar: Secondary.** [Formerly SCED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

## Social Studies Education

**SSED 2100. Scientific and Historical Reasoning in Young Children.** [Formerly SSED 2100] This course focuses on issues of the development of subject matter reasoning and understanding in young children. The course will examine the interplay between informal and formal experiences that influence the development of scientific and historical reasoning as children transition from their intuitive theories to a more formal study of subject matter disciplines. [3]

**SSED 3240. Teaching Social Studies in Elementary Schools.** [Formerly SSED 2210/2240] Study of conceptual structure of social studies curricula with emphasis on curricular objectives, instructional approaches, teaching materials, and evaluative strategies focusing on teaching social studies in grades K-5, with emphasis on grades 2-5. Corequisite: SCED 3240 and EDUC 3240. [2]

**SSED 3260. Human Geography.** [Formerly SSED 2400] (Also listed as SSED 6240 for Professional Students) An examination of the human and cultural aspects of various regions of the world including the spatial manifestations of culture, population distribution and movements, language, religion, ethnicity, political geography and resource issues. The course examines human geography themes at local, national and international levels and probes the nature of geographical thinking and the characteristics of geography as a social science. [3]

**SSED 3320. Introduction to Literacies in the Social Studies.** [Formerly SSED 2690] This course is intended for licensure candidates in secondary education for social studies and for other students who want to explore the concepts and practices of disciplinary literacy that is the links between content and communication. [3]

**SSED 3370. Teaching Social Studies in Secondary Schools.** [Formerly SSED 2370] Instructional principles and techniques of teaching social studies. Required of students seeking secondary school licensure in social studies, a social science field, or history. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: SSED 3371. [3]

**SSED 3371. Practicum in Secondary Education III.** [Formerly SSED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite: SSED 3370 [1]

**SSED 3850. Independent Study in Social Studies Education.** [Formerly SSED 2960] Semi-independent study on selected topics in social studies education. May be repeated. Consent of supervising instructor required. [1-3]

**SSED 3890. Special Topics in Social Studies Education.** [Formerly SSED 2690] Exploration of special topics related to social studies education. May be repeated with change of topic. [1-3]

**SSED 4963. Student Teaching Seminar: Secondary.** [Formerly SSED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

## Peabody Honor Scholars

**PSCH 1110. Peabody Honors Seminar I.** Spring seminar for selected Peabody students. [3]

**PSCH 1115. Peabody and Patterson Scholars Seminar.** Seminar for First-year Peabody and Patterson Scholars. Topics will vary. [3]

**PSCH 2110. Patterson Scholarship Seminar II.** Seminar for Patterson Scholars in the second year of study. Topics will vary. [0-1]

**PSCH 2115. Peabody Scholars Seminar II.** Seminar for Peabody Scholars in the second year of study. Topics vary. [0-3]

**PSCH 3110. Patterson Scholars Seminar III.** Seminar for Patterson Scholars in the third year of study. Topics vary. [0-1]

**PSCH 4965. Peabody Scholars Capstone Seminar I.** Capstone Seminar for Peabody Scholars to be taken fall semester of the senior year. [0-3]

**PSCH 4966. Peabody Scholars Capstone Seminar II.** Capstone Seminar for Peabody Scholars to be taken spring semester of the senior year. [0-3]

# Peabody College

CAMILLA P. BENBOW, Ed.D., Dean  
 XIU CHEN CRAVENS, Ph.D., Associate Dean for International Affairs  
 DAVID K. DICKINSON, Ed.D., Associate Dean for Research  
 JOSEPH F. MURPHY, Ph.D., Associate Dean for Special Projects  
 MONIQUE ROBINSON-NICHOLS, Ed.D., Associate Dean for Students  
 and Equity, Diversity, and Inclusion  
 JACCI L. RODGERS, Ph.D., Associate Dean for External Affairs  
 SHARON L. SHIELDS, Ph.D., Associate Dean for Professional Education  
 CRAIG A. SMITH, Ph.D., Associate Dean for Undergraduate Education  
 BETTY S. LEE, M.Ed., Assistant Dean, Office of Academic Services  
 DAWN HALE, B.F.A., Assistant to the Dean

## Faculty Council

Maury Nation, Deborah Rowe, Megan M. Saylor, Heather L. Smith. Ex  
 Officio: Camilla P. Benbow.

## Endowed Chairs and Named Professorships

Patricia and Rodes Hart Dean of Education and Human Development  
 Patricia and Rodes Hart Professor of Psychology and Human  
 Development  
 Patricia and Rodes Hart Professor of Educational Leadership and Policy  
 Frank W. Mayborn Professor  
 Dunn Family Chair in Educational and Psychological Assessment,  
 Special Education  
 Currey-Ingram Chair in Special Education  
 Nicholas Hobbs Chair in Special Education  
 Betts Professor of Education and Human Development  
 Endowed Chair in Teaching and Learning  
 Susan Gray Chair in Education and Human Development

## Committees of the Faculty Council

Affirmative Action and Diversity  
 Curriculum  
 Faculty Affairs  
 Teaching  
 Research

## Council on Teacher Education

Camilla P. Benbow, Chair.

## Faculty

BROOKE A. ACKERLY, Associate Professor of Political Science;  
 Associate Professor of Human and Organizational Development;  
 Associate Professor of Law  
 B.A. (Williams 1988); Ph.D. (Stanford 1997) [2001]  
 ROBERT DALE BALLOU, Associate Professor of Leadership, Policy, and  
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 B.A. (Stanford 1972); Ph.D. (Yale 1989) [2002]  
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 (Interdenominational Theological Center 1995); Ph.D. (Georgia State  
 1999) [2008]  
 ERIN ELIZABETH BARTON, Assistant Professor of Special Education  
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 [2013]

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 State 1980) [1992]  
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 [2014]  
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 MARISA A. CANNATA, Research Assistant Professor of Leadership,  
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 MARK D. CANNON, Associate Professor of Leadership and Organizations  
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 1998) [1998]  
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 [2006]  
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 Law; Professor of Health Policy; Professor of Public Policy and  
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 ERIK WILLIAM CARTER, Professor of Special Education  
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 2007) [2009]

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- DAVID S. CORDRAY, Professor of Psychology, Emeritus  
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