University of Camerino
School of Science
and Technology

MATHEMATICS AND APPLICATIONS

Master Degree
Second Cycle Degree
Duration 2 years
ECTS credits 120
Campus Location Camerino
web site
www.mat.unicam.it

School of Science and Technology
Mathematics Division

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Delegates

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Stage and Placement (Internship)
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INTRODUCING THE MASTER
The Master Degree Course in Mathematics and Applications
- strengthens the knowledge of Pure Mathematics,
- proposes two different curricula introducing students to research and didactics in Mathematics, or applications to Economics and Finance, or applications to Technology and Engineering,
- through the High Apprenticeship or teaching experiences, prepares students for the world of work.

The master benefits of a longstanding and well appreciated didactical expertise, a friendly and skillful teaching staff, and reliable supporting structures (such as study and work rooms, computer facilities, libraries) in addition to dedicated tutorship services. Among the research programs developed in Mathematics in Camerino and related to our Master let us recall design of electric cars and racing cars, applications to earth and sea sciences, economics and finance, health (medical diagnostic), disability problems (exoskeleton) and much more.

ADMITTANCE REQUIREMENTS
- Bachelor Degree that satisfies the requirements for access to University Master Degree courses
- List of subjects studied (transcript of records with grades obtained) at least 30 ETCS in Mathematics
- Level of language proficiency (strongly recommended) : ENGLISH level B2 (Independent User) A commission will assess the skills necessary to enrol.
Further information on admission rules, pre-admission deadline and other services at http://international.unicam.it

CAREER OPPORTUNITIES
- Italian students can consider a teaching experience, please ask prof. Sonia l'Innocente - sonia.linnocente@unicam.it - about kit courses introducing to the Italian educational world and similar perspectives.
- Students interested in a job in industry (constructing and applying mathematical models in economical and industrial settings, in public departments or managements) are invited to visit www.unicam.it/master or ask prof. Pierluigi Maponi - pierluigi.maponi@unicam.it
- Students interested in scientific research are invited to consider the PhD program in Mathematics www.unicam.it/laureati/dottorato, ask the thesis advisor or prof. Carlo Lucheroni - carlo.lucheroni@unicam.it

Classes are held in English

HR EXCELLENCE IN RESEARCH

COURSE STRUCTURE

The Master Degree Course in Mathematics and Applications is organized into two different curricula: one on Theoretical and Educational Mathematics and the second on Applied and Engineering oriented Mathematics.

There are two Semesters, from October to the end of January, and from March to mid-June. The Winter Exam Session is in February.

The study plan is organized according to the following tables:

Table 1 Theoretical and Educational Mathematics

	Ects
Advanced Algebra term I	6
Advanced Mathematical Logic term II	6
Advanced Geometry divided into:	
Differential Geometry, term I	6
Differential Topology, term II	6
General Relativity term I	6
Advanced Mathematical Analysis term I	6

Table 2 Applied and Engineering oriented Mathematics

	Ects
Advanced Probability and Stochastic Processes divided into:	
Advanced Probability, term I	6
Stochastic Processes, term II	6
Advanced Applied Mathematics divided into:	
Nonlinear Optimization, term I	6
Numerical Methods for Differential Equations, term II	6
Systems Analysis and Control Theory divided into:	
System Analysis, term I	6
Control Theory, term II	6

Table 3 Additional courses on Theoretical and Educational Mathematics, 6 ETCS each.
For details about the academic discipline code reference, see Description of the curricula below.

Computability and Complexity	term I, INF/01
Educational Mathematics	term I, MAT/04
Quantum Computation	term I, FIS/02
Theoretical Physics	term I, FIS/02
Critical Point Theory	term I, MAT/05
Noneuclidean Geometry	term II, MAT/03
Knots Theory	term II, MAT/03
Lie Algebras and Lie Groups	term I, MAT/02
Advanced Mathematical Physics	term II, MAT/07

Table 4 Additional courses on Applied and Engineering oriented Mathematics, 6 ETCS each. For details about the academic discipline code reference, see Description of the curricula below.

Computational Graphics	term I, INF/01
Dynamic and Stochastic Optimization in Finance and Economics	term I, SECS/06
Inverse Problems in Remote Sensing Applications	term I, MAT/05
Machine Learning	term I, MAT/09
Nonlinear Control Theory	term I, ING-INF/04
Advanced Mechanical Design	term II, ING-IND/14
Computational Methods for Finance	term II, MAT/08
General Relativity	term I, MAT/07

Students are strongly encouraged to choose courses from Table 1 and 2 in their first year of enrollment.
Students are also recommended to check every year with the Course Coordinator the classes from Table 3 and 4 and their terms.

Description of the two curricula

Theoretical and Educational Mathematics
- All courses from Table 1 (36 ECTS)
- The first 2 courses of 12 ECTS in the Table 2 (24 ECTS).
- 3 courses of 6 ECTS each from Table 3, with at least one MAT and one non-MAT course.
- Optional courses chosen by the student (12/18 ECTS).
- Master thesis (30/24 ECTS).

Applied and Engineering Oriented Mathematics
- All courses from Table 2 (36 ECTS).
- 24 ECTS from Table 1 with academic discipline codes MAT/01, MAT/02, MAT/03, MAT/05.
- 3 courses of 6 ECTS each from Table 4, (18 ECTS), with at least one MAT and one non-MAT course.
- Optional courses chosen by the student (12/18 ECTS).
- Master thesis (30/24 ECTS).

Optional courses chosen by the student
The ETCS reserved for these activities can include
- Additional courses in Mathematics,
- courses in Physics, Computer Science, and so on,
- courses of Advanced English, or other languages,
- seminars on Mathematics and its Applications (in Italian),
- High Apprenticeship (see below).

Students with an undergraduate degree not in Mathematics are strongly recommended to choose the optional courses to complete their preparation in basic Mathematics. Moreover, they are warmly invited to contact the Course Coordinator and discuss the best choice.

High Apprenticeship
It is a 1 year job training experience. To this end, students may use
- the ETCS devoted to optional courses,
- the ETCS of the final thesis.

Knowledge of the Italian language is strongly recommended.
For any information please ask well in advance prof. Pierluigi Maponi (pierluigi.maponi@unicam.it), also in order to define a specific study plan.

Master thesis
The final thesis is prepared under the supervision of a professor. Students are asked to contact with due advance their advisor to define the topic.

QUALITY ASSURANCE SYSTEM
UNICAM Quality Management System Certificate ISO 9001:2008 (from AFAQ-France, a French leader and one of the first certification bodies at the global level) guarantees students the quality of services provided. The guarantee is via a rigorous analysis of internal organizational procedures and the prompt addressing of any weaknesses or shortcomings whether detected or reported by the students themselves.
The Quality Management System includes the following support services for students: orientation and guidance, mentoring, International mobility, Internships and communication. These integrate with and support the educational activities, so as to contribute to the complete training of the student.

For 2019, in the **U-MULTIRANK** international ranking, UNICAM was placed among the top 25 universities in the world in the area of international orientation, chosen among 1700 universities (of which 49 are Italian) from 96 countries.
The annual ranking takes into consideration the areas of greatest interest to students such as teaching and learning, knowledge transfer, orientation and research.

a.y. 2019/2020