

Establishing the School of Engineering and Applied Sciences: Rationale and Key Issues

Science and engineering, ever changing, are becoming increasingly coupled. Their interplay is leading to dramatic progress in knowledge and technology; the resulting innovations are playing an increasingly central role in global transformations. They are driving economic development, underpinning cultural changes, and helping meet societal challenges in areas as diverse as energy, the environment, human health, national security, and even governance.

In almost all areas of human knowledge, Harvard has long fostered efforts that are higher in quality than, and similar in scale to, its peers. Until recently, Harvard's engineering and applied sciences programs were too small to compete with those of comparable institutions except in isolated specialties. With the renewal and growth of the Division of Engineering and Applied Sciences over the past decade, Harvard is well positioned to correct its historical underinvestment in engineering and applied sciences and to make the program as robust and distinguished as other parts of the Faculty of Arts and Sciences.

We also have a great opportunity to educate “renaissance engineers”—students grounded in the liberal arts and cognizant of, and responsive to, societal issues and concerns. At the same time, Harvard engineering and applied sciences faculty can help better prepare the extraordinarily talented and diverse students from all parts of the College to become leaders who understand technology and its relationship to society and the world.

To be a great global university, our research and educational programs must match the changing needs of the times and meet the challenges posed by the future; enhancing our engineering and applied sciences to the appropriate scale and scope should be seen as integral to this goal.

We have a chance to build a unique program, which will reflect our genesis as the Lawrence School, build on our past successes, and draw on the broad strengths of the University. Such a program would be a nationally prominent model of engineering and applied sciences education, research, and practice for the 21st century.

1. What is the rationale behind the establishment of the School of Engineering and Applied Sciences (SEAS)?

The conversion of the Division of Engineering and Applied Sciences (DEAS) to the School of Engineering and Applied Sciences (SEAS) is an evolutionary step following the renewal and growth of DEAS over the past decade. As a school, engineering and applied sciences will be more visible within and outside Harvard.¹ External visibility will help us attract top faculty and students at a time when most engineering programs in the country, already larger than Harvard's, are recruiting heavily. Success in the

¹ It should be noted that virtually all major engineering programs in the country (including most of the Ivies) reside in “schools” of engineering.

recruitment of suitable faculty and students is essential for meeting our goals of transformative education, research, and practice. At the same time, we intend for SEAS to maintain the essential elements of the DEAS tradition: a strong commitment to teaching in addition to high-quality basic and applied research fostered by an interdisciplinary, boundary-less culture.

2. Where did the idea of SEAS come from?

The idea of establishing SEAS has been under consideration since Dean Narayanamurti arrived at Harvard in 1998. The “school” concept was strongly endorsed by the 2002 Report of the DEAS Visiting Committee of the Board of Overseers, reiterated by the 2005 Visiting Committee, and has received the strong support of the full Board of Overseers and other advisory bodies. Two DEAS faculty committees studied this concept in the spring of 2006; the entire DEAS faculty has discussed it and voiced its broad support.

3. How will the relationship with the Faculty of Arts and Sciences (FAS) change?

SEAS will maintain academic linkages to FAS. The DEAS traditions of teaching non-concentrators, supporting joint faculty appointments (a third of the faculty members in DEAS now have joint appointments, with particularly strong linkages to Physics and Earth & Planetary Sciences), and sustaining cross-disciplinary research collaborations will continue. Undergraduates in SEAS will continue to be admitted by and enrolled in Harvard College; its graduate students will be enrolled in the Graduate School of Arts and Sciences. SEAS faculty will continue to teach courses for the broader undergraduate population. New linkages and collaborations are expected with FAS-Biology, Chemistry, and parts of the social sciences and humanities as well as with certain professional schools. We will also continue to work closely with FAS’ academic offices on issues such as faculty and student recruitment. For all of these reasons, SEAS will be a “school within a school” rather than an entity independent of FAS. On non-academic administrative issues, however, we expect to enhance our historical autonomy (in finance, research administration, and other operational issues) and are working with FAS and the Central Administration to manage this transition process.

4. How will SEAS be funded?

Historically, DEAS has been primarily funded through the Gordon McKay endowment and with other restricted funds. The renewal and expansion of DEAS was made possible through the growth of these endowments and by raising new chairs. DEAS, however, cannot become a highly visible school of engineering and applied sciences without more resources. We expect to raise additional funds mainly from supporters of engineering and applied sciences, as was the case with the recently completed DEAS Challenge Fund.

5. How large will SEAS be?

DEAS currently has about 70 FTE faculty members. We anticipate growth to about 100 FTEs over the next ten years to allow SEAS to fill intellectual holes in existing disciplines and to develop critical mass in key areas. At this size, SEAS will be

comparable in scale to our closest peers such as Princeton and Caltech.² Such growth will also enable us to strengthen our presence in emerging research areas that lie at the intersections of engineering and applied sciences and society, such as biologically-inspired engineering, energy technologies, and computation and society. Furthermore, as we grow, we intend to build upon our recent successes in enhancing diversity, and will continue to improve the ways we recruit and support women and other minority faculty and students.

6. How will SEAS be able to compete with other top engineering programs?

While we might compete with places like MIT, Stanford, and Caltech for faculty and students (and already do so successfully), we do not intend to emulate or be “lite” versions of these great engineering programs. We plan to take a more focused and strategic approach that builds on DEAS’ strong interdisciplinary culture, on the College’s liberal arts tradition, and on Harvard’s deep strengths in various scientific disciplines and professional areas. We aim to build a different kind of engineering program: one that is rooted in the sciences, has no internal departments or boundaries, and is of a manageable scale. Doing so will allow us to remain nimble and interdisciplinary. We also intend to be connected to Harvard’s outstanding professional schools; this gives us an additional advantage over other schools (including Princeton, our closet peer among the Ivies). Our engineering program will be unique and serve as a nationally prominent model of engineering education, research, and practice for the 21st century.

7. Where will the new SEAS faculty be located?

Some of the new faculty members will reside in existing DEAS facilities and in the Northwest and LISE buildings. Others may occupy new space in Cambridge and Allston, depending on the results of the ongoing University-wide planning for science and engineering.

8. Will the establishment of an “application-oriented” school be counter to Harvard’s tradition and mission?

The Lawrence Scientific School (the institutional and intellectual progenitor of DEAS) was established in 1847 at Harvard in order to train scientists and engineers. We envision SEAS as the Lawrence School reborn, but in a new form appropriate for the 21st century. Moreover, a stronger engineering and applied sciences program will be key to fostering advances in the natural sciences, increasing benefits in the social sciences and humanities, and adding to the educational curriculum for undergraduates at the College. Many of the research and educational activities that are part of the SEAS vision mesh naturally with the “hands-on” and “experiential” learning that are under discussion throughout all parts of Harvard.

² Princeton’s engineering and applied sciences program has about 125 faculty members and Caltech’s has about 100; both institutions have plans to grow their faculty in the next few years. For comparison, MIT’s engineering school has 360 faculty members, Cornell’s has 250, and Stanford’s has 210.