Overview
2011–2012
Harvard School of Engineering and Applied Sciences (SEAS) serves as the connector and integrator of Harvard's teaching and research efforts in engineering, applied sciences, and technology. Our core tenets—educating broad-minded students; interdisciplinary research; integration across disciplines; and balancing theory, experimentation, and practice—create an unmatched environment for learning and exploration. Through collaboration with researchers from all parts of Harvard, other universities, and corporate and foundational partners, we bring discovery and innovation directly to bear on improving human life and society.

Year Founded 1847 (as the Lawrence Scientific School)

Dean Cherry A. Murray

Degrees Offered A.B., A.B./S.M., S.B., S.M., M.E., Ph.D.

Undergraduate Concentrations
- Applied Mathematics (including secondary field)
- Biomedical Engineering
- Computer Science (including secondary field)
- Engineering Sciences (including ABET-accredited S.B.)

Graduate Programs
- Applied Mathematics
- Applied Physics
- Computer Science
- Engineering Sciences (Bioengineering; Electrical Engineering; Environmental Science & Engineering; Materials Science & Mechanical Engineering)
- Secondary Field in Computational Science & Engineering

Research Tracks
- Applied Mathematics & Computational Science
- Computer Science
- Electrical Engineering
- Energy & Environmental Systems
- Innovation & Entrepreneurship
- Marriage of Biological & Artificial Systems
- Materials & Devices
- Science, Technology, & Public Policy

Faculty* 83 (71 FTEs)
Total participating: over 100
(including non-ladder and teaching faculty)

Number of Students* Undergraduate: 465
Graduate: 378

Sponsored Research* $42.3 million federal
$8.5 million non-federal
$4.4 current use gifts

Staff Administrative staff: 125
Researchers (postdocs, appointees, staff): 410

Endowment $765.9 million (end of FY2010)

Campus Six buildings + shared facilities
(over 400,000 sq. ft. of classroom, research, and office space)

Affiliated Graduates Over 7,000

* 2010 data
Harvard University

Founded in 1636, Harvard is America’s oldest university. Harvard offers an extraordinary scope: a curriculum with 3,500 courses and over 40 areas of concentration; the largest university library system in the world; a universally renowned faculty; more than 400 student organizations and 41 intercollegiate athletic teams; a House system that combines the intimacy of a small college with the rich and stimulating environment of a university; state-of-the-art research centers, laboratories, and museums; the resources of 11 graduate and professional schools; and the varied cultural, educational, and recreational offerings of Cambridge and Boston.
Administration & Faculty

Academic Leadership

Dean, Harvard School of Engineering and Applied Sciences
Cherry A. Murray

Area Dean for Applied Mathematics
Tim Kaxiras

Area Dean for Applied Physics
Eric Mazur

Area Dean for Bioengineering
Cherry A. Murray

Area Dean for Computer Science
Michael Mitzenmacher

Area Dean for Electrical Engineering
Evelyn Hu

Area Dean for Environmental Science and Engineering
Steven Wofsy

Area Dean for Materials Science and Mechanical Engineering
Joost Vlassak

Associate Dean for Academic Programs
Gu-Yeon Wei

Assistant Dean for Academic Programs
Marie D. Dahleh

Administrative Leadership

Executive Dean for Research and Education
Fawwaz Habbal

Chief Financial Officer / Associate Dean for Finance and IT Operations
Harry Dumay

Associate Dean for Resource Development and Alumni Relations
Linda G. Fates

Associate Dean for Administration and Academic Affairs
Ed Kleifgen

Assistant Dean for External Programs; Executive Director of the Institute for Applied Computational Science
Rosalind “Ros” Reid

Associate Dean for Research Planning and Chief Technologist
Jayanta “Joy” K. Sircar
Faculty Profile

Ladder Faculty

<table>
<thead>
<tr>
<th>Level</th>
<th>Tenured</th>
<th>Associate</th>
<th>Assistant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>66/51</td>
<td>11/9.5</td>
<td>11/10</td>
</tr>
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</table>

Non-Ladder Faculty

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>Professor of the Practice</td>
<td>4/1.75</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>4/1.2</td>
</tr>
<tr>
<td>Lecturer</td>
<td>11/6</td>
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</table>

Diversity

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Tenured Women</td>
<td>11%</td>
</tr>
<tr>
<td>Non-Tenured Women</td>
<td>25%</td>
</tr>
<tr>
<td>Tenured Asian/Minority</td>
<td>19%/0%</td>
</tr>
<tr>
<td>Non-Tenured Asian/Minority</td>
<td>35%/10%</td>
</tr>
</tbody>
</table>

Impact

Harvard University is one of the world’s strongest places for research in science and engineering. As of 2011, 45 current and former Harvard faculty members and alumni have been awarded Nobel Prizes. The University boasts 167 members of the National Academy of Sciences, more than any other institution in the country, and within SEAS there are 15 members of the National Academy of Engineering, 15 members of the National Academy of Sciences, and 21 members of the American Academy of Arts and Sciences.

Joint Appointments

Many members of the faculty at SEAS hold joint appointments with other areas of the University, including the departments of astronomy, chemistry & chemical biology, earth & planetary sciences, molecular & cellular biology, organismic & evolutionary biology, and physics; and at the Harvard Kennedy School, Harvard Medical School, Harvard Law School, and the Harvard School of Public Health.
Undergraduate Profile

Undergraduates are enrolled in four concentrations: Applied Mathematics, Computer Science, Engineering Sciences, and Biomedical Engineering (introduced in 2010).

By the numbers

The Harvard College class of 2015 was selected from a pool of nearly 35,000 applicants. Among those admitted, 49% are women; 18% Asian; 12% Latino; 12% African American; 1.9% Native American; and 0.2% Native Hawaiian. 23% of students hail from outside of the United States. Over 50% of the entering class expects to concentrate in biological, physical, engineering, computer sciences or mathematics. Approximately 465 undergraduates concentrate in engineering and applied sciences, and over 4,500 students from various concentrations are enrolled in classes offered by SEAS during a given year. The number of concentrators at SEAS has increased by 45% since 2007.

Engineering the Harvard way

Harvard is designed to create 21st-century engineers, students who excel in applied science but also have a broad knowledge of other disciplines. Students in engineering and applied sciences are part of a liberal arts environment, interacting with classmates from completely different concentrations in their dorms, houses, dining halls, and clubs.

Hands-on, minds-on

The CS 50 Fair

The annual CS 50 Fair is the culmination of the popular “Introduction to Computer Science” course. At the fair, the students present their final programming projects to thousands of members of the Harvard community in a festive environment.

Science & Cooking Course

Created through a partnership with the Alícia Foundation, headed by acclaimed chef Ferran Adrià, the highly popular course uses food to explicate fundamental principles in applied physics and engineering. Tasty topics include: gelation, browning and oxidation, and meat glue.

I3 competition

Undergraduates can compete to win summer funding and space by submitting business plans for projects involving for-profit startups, campus service ventures, and social entrepreneurship.
Undergraduate & Graduate Studies

Graduate Profile

Our doctoral and master’s degree programs lie at the interfaces of engineering, the applied sciences (from biology to physics), and technology. In keeping with the interdisciplinary nature of modern research, we do not have traditional academic departments. Graduate programs include Applied Mathematics, Applied Physics, Computer Science, Engineering Sciences (with four possible tracks), and a new secondary field in Computational Science and Engineering.

Number of Applicants/Selectivity

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Applicants</th>
<th>Total Number Admitted</th>
<th>Acceptance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>1,993</td>
<td>171</td>
<td>8.6%</td>
</tr>
</tbody>
</table>

Admitted Ph.D. Students (2010)

- Average undergraduate GPA: 3.7
- Average GRE Verbal Score: 548
- Average GRE Quantitative Score: 800
- Average GRE Analytic Score: 4.0

Current Graduate Students (2011)

- Full Time Students: 99%
- Male/Female: 72%/28%
- Minority: 15.8%
- Foreign Nationals: 48%

Top Crossover Programs

Accepted graduate students in engineering and applied sciences who chose not to attend Harvard most commonly went to: Stanford University, MIT, UC Berkeley, Carnegie Mellon University, Columbia University, Cambridge University (UK), Princeton University, California Institute of Technology (Caltech), or the University of Pennsylvania.
Research

Applied Mathematics & Computational Science
• Control Theory and Stochastic Systems
• High Performance Computing
• Modeling Physical/Biological Phenomena and Systems
• Theory of Computation

Computer Science
• Artificial Intelligence and Computational Linguistics
• Computation and Economics
• Graphics, Visualization, and Imaging
• Human-Computer Interaction
• Intelligent Systems and Computer Vision
• Languages, Compilers, and Operating Systems
• Multi-Agent Systems
• Information, Systems, and Networks
• Privacy and Security
• Theory of Computation

Electrical Engineering
• Computer Engineering and Architecture
• Circuits and VLSI
• Signal Processing
• Robotics and Control

Energy & Environmental Systems
• Atmospheric and Climate Modeling
• Energy and Environmental Technologies
• Engineering, Economic Development, and Resource Management
• Environmental Chemistry and Microbiology
• Oceans and Geophysics
• Observation and Field Testing
• Pollution Monitoring

Innovation & Entrepreneurship
• Idea Translation and Experiments in the Arts and Sciences
• Social Enterprise
• Start-ups and Technology Transfer

Marriage of Biological & Artificial Systems
• Bio-Inspired Robotics and Computing
• Biomechanics and Motor Control
• Cell and Tissue Engineering and Biomaterials
• Computational Neuroscience and Evolution

Materials & Devices
• Biophysics and Self-Assembly
• Electromagnetics and Nanoelectronics
• Fluid Mechanics
• Materials Science
• Nanophotonics
• Quantum Devices
• Soft Condensed Matter
• Solid Mechanics
• Surface and Interface Science

Science, Technology, & Public Policy
• Communications and Internet Policy
• Energy, Environment, and Sustainability
• Governance of Emerging Technologies/Innovation Policy
• Engineering Science and Engineering Education
Key Affiliated Research Centers & Initiatives

BASF Advanced Research Initiative at Harvard University
research.initiative.seas.harvard.edu

Center for Nanoscale Systems (CNS)
www.cns.fas.harvard.edu

Center for Research in Computation and Society (CRCS)
www.crcs.seas.harvard.edu

Institute for Applied Computational Science (IACS)
iacs.seas.harvard.edu

Kavli Institute for Bionano Science and Technology (KIBST)
www.kavli.seas.harvard.edu

Materials Research Science and Engineering Center (MRSEC)
www.mrsec.harvard.edu

Nanoscale Science and Engineering Center (NSEC)
www.nsec.harvard.edu

Rowland Institute at Harvard
www.rowland.harvard.edu

Wyss Institute for Biologically Inspired Engineering (Wyss)
www.wyss.harvard.edu

Harvard is also part of an integrated partnership called the National Nanotechnology Infrastructure Network (NNIN), comprising 13 user facilities.
Our faculty, students, and postdocs are naturally adventuresome (and encouraged to be so); they work beyond traditional boundaries, allowing problems and answers to develop on their own terms, unfettered by fields. Throughout the University, researchers collaborate to solve the world's greatest challenges, from energy and the environment to medicine and public health.

Recent innovations at SEAS have included:

- Engineered cardiac tissue with embedded neural networks
- LeWhif inhalable chocolate, coffee, vitamins, and insulin
- A multicore voltage regulator to make smartphones more efficient
- Nanostructured surfaces that repel water and ice
- An ultra-sensitive biosensor that does not rely on fluorescent tags
- Self-organizing algorithms for dynamic control of robots

Nurturing New Ideas

The Technology and Entrepreneurship Center at Harvard (TECH) promotes student innovation across campus through project-based courses, competitions such as I³, and community building activities. The Harvard Innovation Lab (i-Lab) will enhance ties between SEAS and Harvard Business School, providing space and mentoring. Additionally, the Harvard Office of Technology Development fosters strategic collaborations with industry through licensing, sponsored research, and new venture agreements.
Some Harvard-affiliated Companies

- 3COM/Polaris Partners (tech/finance)
- Electronic Arts, Digital Chocolate (games)
- EOS Photonics (quantum cascade lasers)
- Genzyme (biotech)
- GnuBio (DNA sequencing)
- Rumford Baking Powder (culinary/chemistry)
- Flour Bakery (food/restaurant)
- Facebook (web/social media)
- iLike (web/social media)
- Locately (consumer location analytics)
- Microsoft (software)
- OkCupid (dating website)
- OPOWER (software/energy efficiency)
- Paperless Post (online stationery)
- Raindance (microfluidics)
- Scribd (web/social media)
- SiEnergy (fuel cells/alt. energy)
- SiOnyx (black silicon/alt. energy)
- Zappos (online retail)

Partnerships in Action

Examples of notable successes and new ventures include:

**BASF:** Set up as an integrated partnership, the BASF Advanced Research Initiative at Harvard benefits from having strong ties with departments and schools throughout the University.

**Bill and Melinda Gates Foundation:** Through support from the Gates Foundation, researchers are developing a microbial fuel cell–based charger that can be cheaply assembled and may help increase access to health care in the developing world.

**Google:** Postdoctoral researchers at Harvard recently teamed up with Google to create a tool that quantitatively analyzes social and cultural trends in centuries’ worth of digitized books; they dubbed the new field “culturomics.”

**National Science Foundation (NSF):** The NSF funds two large multidisciplinary research centers, MRSEC and NSEC, dedicated to advancing materials science and nanoscale science and engineering.

**NVIDIA:** Researchers at Harvard collaborate with those at NVIDIA on projects involving massively parallel computing, using sophisticated graphics processing units (GPUs) donated by the company.

**SiOnyx:** This spin-off venture is dedicated to commercializing black silicon, a novel material developed by a Harvard professor.
What do SEAS alumni go on to do? Everything. As bakers and animators, 21st-century shoe salesmen and government officials—and, yes, programmers, researchers, inventors, professors, analysts, consultants, and CEOs—SEAS alumni continually redefine what it means to be an engineer.

Some Notable Alumni

John Armstrong  AB ’56, PhD ’61, former Vice President for Science and Technology at IBM, member of the National Science Board

Michael Aziz  SM ’80, Ph.D. ’84, Gene and Tracy Sykes Professor of Materials and Energy Technologies at SEAS

Steve Ballmer  AB ’77, Co-Founder and current CEO of Microsoft Corporation

Leo Beranek  Ph.D. (SD ’40), HBS AMP ’65, former President of BBN Technologies, National Medal of Science winner

Hynd Bouhia  Ph.D. ’98, Director, Casablanca Stock Exchange

Fred Brooks  Ph.D. ’56, Kenan Professor of Computer Science at UNC, best known for managing the development of OS/360. He received a Turing Award.

Joanne Chang  AB ’91, Owner of Flour Bakery + Cafe and the Boston restaurant Myers + Chang

R. Martin Chavez  AB ’85, SM ’85, Partner, Goldman Sachs

George David  AB ’64, Former Chairman and CEO of United Technologies

Shaun Donovan  AB ’87, Masters in Architecture and Public Administration ’95, U.S. Secretary of Housing and Urban Development

Danielle Feinberg  AB ’96, Technical Director, Pixar Animation Studios

Victor Fung  Ph.D. ’71, Chairman, Li and Fung Ltd.

Bill Gates  LL.D ’07, Co-Founder and Chairman of Microsoft Corporation

Paul Graham  Ph.D. ’90, programmer, venture capitalist, and essayist, known for his work on Lisp; co-founder of Viaweb (now the Yahoo! Store web system)

Trip Hawkins  AB ’76, Founder of Electronic Arts, 3DO, and Digital Chocolate

Martha Heitzmann  Ph.D. ’97, Senior Executive Vice President of Research and Innovation at Areva Group, a French energy company
Tony Hsieh  AB ’95, founder of online shoe seller Zappos.com

George Joseph  SB ’49, Chairman, Mercury General

Harry Lewis  AB ’68, AM ’73, Ph.D ’74, Gordon McKay Professor of Computer Science at SEAS, Harvard College Professor, former Dean of Harvard College

David Malan  AB ’99, SM ’04, Ph.D ’07, Lecturer at Harvard, instructor for the introductory computer science course CS 50, one of the most popular on campus

Joe Marks  Ph.D. ’91, VP of R&D, Disney Animation Studios

Bob Metcalfe  Ph.D. ’73, University of Texas Austin, Polaris Partners, National Medal of Technology, co-inventor of the Ethernet

Ali Partovi  AB ’94, CEO of iLike

Hadi Partovi  AB ’94, Senior Vice President, MySpace

Choon Fong Shih  Ph.D. ’73, President of King Abdullah University of Science and Technology in Saudi Arabia

Allen E. Puckett  SB ’39, SM ’41, one of the leading figures in fluid mechanics/wind tunnels, former Chairman of Hughes Aircraft Corp., National Medal of Science winner

Dennis Ritchie  AB ’63, AM ’65, inventor of the C programming language and co-developer of the UNIX operating system, for which he earned a Turing Award and the National Medal of Technology

Peter P. Rogers  Ph.D. ’66, Gordon McKay Professor of Environmental Engineering at SEAS

Craig Silverstein  AB ’94, Director of Technology, Google

Alfred Spector  AB ’76, Vice President of Research and Special Initiatives, Google

Guy Steele  AB ’75, Distinguished Engineer, Sun Microsystems

Alan Taub  Ph.D. ’79, Vice President of Global Research and Development, General Motors

Salil Vadhan  AB ’95, Director of the Center for Research on Computation and Society at SEAS, Vicky Joseph Professor of Computer Science and Applied Math

Stephanie Wilson  SB ’88, NASA Astronaut

Daniel Yates  AB ’99, CEO of Positive Energy
Our world-class facilities provide over 400,000 square feet of interconnected labs, classrooms, clusters, and offices designed to encourage researchers and students to cross boundaries and to collaborate. SEAS is situated among the buildings housing Biology, Chemistry, Earth and Planetary Sciences, Mathematics, and Physics departments.

**60 Oxford Street**
- Applied Sciences
- Bioengineering
- Wyss Institute

**Northwest Building**
- An FAS interdisciplinary research facility with flexible labs and state-of-the-art classrooms.
- Administration
- Scientific Machine Shop
- Microrobotics
- Undergraduate Laboratories (shared)

**Pierce Hall**
- Administration
- Applied Mathematics
- Bioengineering
- Environmental Sciences & Engineering
- Library
- Mechanical Engineering
- Student Affairs Office
- Undergraduate laboratories

**The Laboratory for Integrated Science and Engineering (LISE)**
LISE, an FAS shared facility, boosts collaboration in the areas of nanoscale science and nanoscale systems research.
- Center for Nanoscale Systems (CNS)
- Buckminster’s Café
Engineering Sciences Lab
- Bioengineering
- Environmental Sciences & Engineering
- Microbiology
- Wyss Institute

Maxwell Dworkin
- Computer Science
- Electrical Engineering
- CS 50 Lounge

Cruft Laboratory
- Applied Physics
- Institute of Applied Computational Science
- Physics

McKay Laboratory
- Applied Physics
- Materials Science
- Mechanical Engineering
Contacts

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Cambridge, MA 02138
(617) 496-9184

Communications Office / General Information
Pierce Hall
(617) 496-3815
communications@seas.harvard.edu

Social Networking
- twitter.com/hseas
- facebook.com/hseas
- harvardseas.tumblr.com

Find us, too, on LinkedIn, YouTube, Digg, Flickr, Scribd, and Blogspot.

Student Affairs Office (for current students)
Pierce Hall 110
(617) 495-2833

How to Apply

Undergraduate students
All prospective undergraduate students apply and are admitted to Harvard College.
www.admissions.college.harvard.edu
(617) 495-1551

Graduate students
All prospective graduate students apply to SEAS through the Graduate School of Arts and Sciences (GSAS).
www.gsas.harvard.edu

Human Resources/Employment

Non-faculty positions
Human Resources Office
(617) 384-7828

For faculty and research positions
Academic Affairs Office
(617) 495-6509

External Relations and Events

External programs
rreid@seas.harvard.edu

Community-based educational programs
(617) 496-7479

Events
(617) 496-2637

Industry partnerships
industry@seas.harvard.edu