Professor of Engineering Management
2019
Harvey Mudd College invites applications for an Engineering Management tenure-track faculty position in its General Engineering program.

The Position

Qualifications

The Department of Engineering seeks candidates with experience and knowledge in engineering management who can excel in teaching in a broadly-based undergraduate curriculum focused on design, manufacturing, and management; signals and systems/control systems engineering; and engineering science. Applicants must have a demonstrated commitment to teaching excellence and professional growth. The degree and experience requirements are: An M.S. or equivalent degree in engineering or a closely related field and five years’ experience with managing technical people & organizations. Preference will be given to candidates with an M.B.A or Ph.D. in management, a Ph.D. in engineering, and/or extensive experience in managing engineers in a technical setting. The appointment is anticipated to be at the associate professor level.

The principal reason for the position is to integrate modern management techniques into our curriculum. Teaching opportunities include developing courses in the applicant’s area of specialty, as well as the department’s required courses in engineering sciences, participation on teaching teams in the design and signals & systems engineering sequences, and supervising sponsored projects in the Engineering Clinic program. Candidates should provide evidence of excellence in teaching and the ability to increase students’ management/leadership skills as well as general and multidisciplinary engineering skills.

Candidate Expectations and Contributions

The successful candidate will build on and leverage the collective experience of the existing faculty to create modern management learning and training experiences for our students. Specifically, the candidate will be asked to develop curriculum, learning, and training experiences to help students manage themselves, their work, and their teams. Expectations include the introduction and integration of management fundamentals and best practices into existing courses and programs that offer student team and project based learning experiences.

- Current team-based course offerings include introductory courses in design and in experimental techniques, two courses which are required of all engineering majors.
- Engineering Clinic is the department’s professional practice program required of all third and fourth year majors, and is entirely team and project based. Each project is sponsored by an industry partner (company) and teams of 4-5 students work with faculty advisors and industry liaisons to achieve project objectives and deliverables. In recent years, and in part due to
the approximately $50,000 price tag of each project, opportunities exist to improve how student teams manage themselves, their technical tasks, schedules, and their sponsor’s expectations.

The candidate is expected to lead a Value Added Proposition audit within the department to assess and evaluate the Engineering Clinic program for the purpose of identifying areas where improved value added can be offered to our students and to our sponsors.

The candidate is also expected to develop modern management courses that offer rigorous learning experiences for our students. While the department values anecdotal and individual managerial experiences, we recognize that our students will require an understanding and working knowledge of management principles that they can build upon throughout their professional careers. Existing courses to be complemented and/or redeveloped include the management of technical enterprise, manufacturing planning and execution, and in risk management and risk informed decision making.

The ultimate goal for the department is to create an integrated program of professional practice experiences to help our students become successful practitioners in the management of technical staff, tasks, and of their organizations.

About the Engineering Department

By the Numbers

Roughly one third of HMC students (70 per class) graduate as engineers (enrollments vary from year to year).
Roughly 20+ full-time faculty.
Six full-time support staff.
The college machine shops are managed by Engineering
Enrollments in required Engineering courses typically range from 20 to 80.
Enrollments in technical electives typically range from 4 to 40.

Program Description

The program, designed to produce graduates who are exceptionally competent and whose work is notable for its breadth and technical excellence, emphasizes an interdisciplinary approach to problem solving. Based on the premise that design is the distinguishing feature of engineering, it includes applied research as early as students’ first year, a curriculum covering applied sciences, systems, and design and professional practice, as well as the Clinic Program—an internationally recognized model of experiential learning.

Engineering majors, who leave Harvey Mudd fully aware of the impact of their work on society, enjoy the benefit of a flexible curriculum that allows them to spend a semester or entire year studying at domestic and international colleges and universities if they wish, and the
opportunity to conduct significant research alongside faculty members, often being named co-authors on published papers.

**Philosophy**

The philosophy of the engineering program at Harvey Mudd College is based on the recognition that there is a professional component that is best addressed through practice gained by working on real problems. The engineering program philosophy is adopted to produce generalists, able to communicate across disciplines through the use and understanding of mathematics and systems-based analysis, who can design effective and innovative solutions to discipline specific problems. Our goal is to graduate students capable of solving real problems that span multiple engineering disciplines. This goal is realized through our three main curricular areas of focus (design, systems, and engineering science), as well as through our emphasis on professional practice. We teach a rigorous theoretical and broad background in these three areas of focus. Layered on this broad-based education is a professional practice component, which is realized through hands-on experiences in the classroom throughout the program, research opportunities, and our junior/senior capstone industry-sponsored clinic projects.

**Goals**

- Produce graduates who are exceptionally competent engineers whose work is notable for its breadth and its technical excellence.
- Provide a “hands-on” approach to engineering so that graduates develop an understanding of engineering judgment and practice, including ethics.
- Prepare and motivate students for lifetime of independent, reflective learning.
- Produce graduates who are aware of the impact of their work on the world.
- Offer a curriculum that is current, exciting and challenging for both students and faculty, but can be completed in four years by any motivated student who is admitted to Harvey Mudd College.

**Curriculum**

Offering rigorous analysis of theoretical principles and intensive hands-on experience, the engineering curriculum is divided into three branches—engineering science, systems, and design and professional practice. In addition, students take three or more technical electives in areas of their choosing.

The engineering sciences courses

- E82 – Chemical and Thermal Processes
- E83 – Continuum Mechanics
- E84 – Electronic and Magnetic Circuits and Devices
- E85 – Digital Electronics and Computer Engineering
- E86 – Materials Engineering

establish a broad base of fundamental knowledge needed by an engineer practicing in the field.
The sequence of systems-and-signal courses
    E79 – Introduction to Engineering Systems
    E101–102 – Advanced Systems Engineering
provide analysis and design tools to model and interpret the transient and frequency response of
general engineering systems. These courses are multidisciplinary in approach, enabling students
to gain a unified view of the entire spectrum of engineering disciplines.

The design and professional practice courses
    E4 – Introduction to Engineering Design and Manufacturing
    E80 – Experimental Engineering
    E111–113 – Engineering Clinic
focus on working in teams on open-ended, externally-driven design projects. Hands-on
exposure to professional practice begins with students working in small teams on open-ended
design problems posed by not-for-profit clients in the first year (E4), continues with a
laboratory course in which students gain skills in designing and running experiments to solve
design problems and characterize engineered systems (E80) and culminates with three
semesters of Engineering Clinic (E111–113).

The technical electives cover advances topics in the engineering sciences, systems and signals,
and manufacturing, management, and engineering economics.

Further Background and Description

Background
Since its inception, Harvey Mudd College has focused on a mission to educate scientifically
minded citizens aware of the responsibility that their competencies would bring. In support of
this mission, the Department of Engineering has created programs and learning opportunities
for its students that are considered to be at the leading edge of engineering education, and that
are designed to educate the next generation of engineering leaders.

In 1958 when the original framework for the engineering program was constructed, a core of
knowledge that prepared a student's facility with mathematics, analytical thinking, and
provided solid underpinnings in the basic principles of the physical sciences was required
preparation in engineering. The authors of the 1958 curriculum study encouraged an
“integration of knowledge around the leading concepts of the essential characteristics of
engineering activity.”

The notion of “leading concepts” reflects an important and valuable tension between
engineering education and practice. The fundamental concepts that undergird engineering
have changed very little since the founding of the college, even though the manner in which
we demonstrate these concepts has been changed by the advent and introduction of modern
technologies. Students still need a solid foundation in chemical, electrical, mechanical, and
material phenomena, unified by a signals-and-systems approach steeped in mathematics. It is the “leading” element of the phrase that challenges us and is the source of the tension.

A high priority for our program is the continued demonstration of technical competency in our students as they enter our nation’s leading graduate programs and industries. The focus on fundamental concepts in engineering design, systems and signals, and in engineering science, allows our students to approach problems with a core “tool set” that facilitates a broad-based solution approach to discipline-specific problems. In recent years, however, there are signs that this focus alone may not be sufficient to guarantee that our students will be positioned to become engineering leaders and address the growing complexities that surround them and our global society.

The Challenge
The challenge is to maintain the technical competencies and general nature of our program while developing a wider range of educational and professional student experiences that include modern leadership, management, and decision-making opportunities. The Department has already taken several major steps in this direction, and now desires to take the next major step.

Program Enhancements and Professional Practitioners
Starting in 2012, the department has recruited industrial practitioners experienced in design, manufacturing, and leadership to create new offerings in design, manufacturing, and management. A framework for a new leadership program has also been developed.

- Dr. Gordon Krauss was hired as the Fletcher Jones Professor of Engineering Design with industry experience that included Staff Scientist at Energizer – Schick/Wilkinson Sword Division where he developed a new lubricating strip technology for the company’s flagship razor product line.
  – Hired at Associate Professor rank, without tenure, into a tenure-track slot.

- Mr. Kash Gokli was hired as Professor of Manufacturing Practice with extensive industrial experience including director of manufacturing engineering, vice president of product development, and senior vice president of total quality management and best practices for Amano USA Holdings, Amano, Cincinnati, Inc.
  – Hired at Full Professor rank, without tenure, into a non-tenure-track slot.

- Mr. Werner Zorman was hired as the Professor of Leadership with industry experience ranging from technical staff to human resource engineering, coming to the college from Cornell University where he was Associate Director of the Cornell Engineering Leadership Program.
  – Hired at Associate Professor rank, without tenure, into a tenure-track slot.
Although these faculty members encompass significant management expertise, the department recognizes that management training for undergraduate engineers must be championed by an individual who can fully integrate modern management techniques into our program.

About Harvey Mudd College

History
- Founded: 1955
- Degrees offered: Bachelor of science
- Majors: biology, chemistry, computer science, engineering, mathematics, physics, independent study program, off-campus major, and joint programs in chemistry and biology, computer science and mathematics, mathematical biology, and mathematics and physics.

Students 2018–2019
- Number of students: 886
- Gender ratio: 51 percent female, 49 percent male
- Student distribution: 47 states/jurisdictions and 31 foreign countries
- Student-to-faculty ratio: 8:1
- Students living on campus: 98 percent

Faculty 2018–2019
- Faculty: 103 tenured or tenure track; 98 percent hold PhD or highest degree in field
- Faculty gender ratio: 37 percent female, 63 percent male

Tuition and Financial Aid 2019-2020
- Tuition: $58,359
- Room and board: $18,679
- Financial Aid: About 73 percent of students receive financial aid

Graduate Placement 2018
- Graduate or professional school: 24 percent
- Workforce: 67 percent
- Median starting salary for Class of 2017: $92,499.50
- Alumni: 6,903 and counting

Finances
- Endowment: $317 million as of June 30, 2018
- Budget for fiscal year 2017–2018: $67 million

Rankings
U.S. News & World Report Best Colleges 2020
- No. 2 – Best Undergraduate Engineering Program. Over the past fifteen years we have alternated between tied for Number 1 with Rose Hulman and Number 2.
- No. 6 – Most Innovative Schools, tied with Spelman College
- No. 19 — Best Undergraduate Teaching, tied with Reed College
- No. 23 – Best National Liberal Arts Colleges, tied with University of Richmond

Selected – Ethnic Diversity list
Selected – Economic Diversity list

PayScale 2019-20
No. 1 – Highest Mid-Career Salaries, PayScale’s 2019-20 College Salary Report
No. 6 – Best Schools for Return on Investment, PayScale’s 2018 College ROI Report.
(Harvey Mudd ranked No. 1 from 2012-2015)

Princeton Review 2019-20
From The Best 385 Colleges, 2020 Edition:
   No. 8 – “Students Study the Most”
   No. 8 – “Most Accessible Professors”
   No. 10 – “Best Science Lab Facilities”

From The Best Value Colleges: 200 Schools With Exceptional ROI, 2019 edition:
   No. 1 – Best Career Placement
   No. 6 – Top 50 Colleges That Pay You Back
   No. 2 – Top 25 Best Value Colleges for Students With No Demonstrated Need

Kiplinger’s 2019
   No. 27 – Best Values in Liberal Arts Colleges

Forbes 2019
   No. 3 – Top Liberal Arts Colleges
   No. 23 – America’s Top Colleges

Harvey Mudd is a highly selective undergraduate liberal arts college emphasizing science, mathematics, and engineering. Many forms of professional engagement are celebrated at the college including consulting and academic publishing in a wide variety of fields. Candidates should discuss how the Harvey Mudd environment would provide opportunities for professional growth in research, consulting, or other forms of scholarship, and how undergraduate students might be engaged in these activities. Candidates must be committed to teaching and mentoring a diverse student population, particularly groups traditionally underrepresented in engineering; candidates from these groups are encouraged to apply.

Applicants should submit: a cover letter, a curriculum vitae, a teaching statement, a professional growth/research statement, a statement describing experience and commitment to teaching diverse student populations, and the names of at least three references. For full consideration, applications should be received by December 1, 2019, but applications will be accepted until the position is filled.

Nominations, applications, and inquiries of interest may be sent in confidence to the College’s executive search firm:

    Martin M. Baker, Managing Partner
    Chelsie Whitelock, Principal
    Buffkin/Baker
Harvey Mudd College enthusiastically welcomes applications from talented individuals from all backgrounds. The College is an Affirmative Action/Equal Opportunity Employer. Qualified applicants will be given consideration for employment without regard to age, race, gender, national origin, sexual orientation, protected veteran’s status, disability, or any other characteristics protected by applicable law. The College’s Equal Opportunity and Nondiscrimination Statement and information about accommodations are available.