
WELCOME TO THE ENGINEERING SCIENCE PROGRAM

Chair: Prof. T. I. Zohdi

(a) Computational Engineering Science advisor: Prof. J. Verboncoeur, NE

(b) Engineering Physics advisors: Prof. D. Attwood, EECS and Prof. J. Wurtele, PHYS

(c) Engineering Mathematics and Statistics advisor: Prof. J. Casey, ME

(d) Environmental Engineering Science advisor: Prof. J. R. Hunt, CEE, and R. Harley, CEE

Student Affairs Officer: Ms. Patricia Berumen

TOPICS

- **ES MISSION STATEMENT:** The undergraduate program in Engineering Science at U.C. Berkeley seeks to provide students with a broad education emphasizing an excellent foundation in scientific and engineering fundamentals. The program prepares undergraduate students for employment or advanced studies with four primary constituencies: industry, the national laboratories, state and federal agencies, and academia (graduate research programs). There are four fully structured majors in the curriculum:
 - (a) Computational Engineering Science
 - (b) Engineering Mathematics and Statistics
 - (c) Engineering Physics
 - (d) Environmental Engineering Science
- **PROGRAM OBJECTIVES:** The objectives of the Engineering Science undergraduate program is to produce graduates who can apply their engineering education to address the full range of technical and societal problems creatively and confidently.

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- **STATISTICS:**
 - (a) Consistently ranked in the top 5 Engineering Science Programs in the US.
 - (b) 25 Faculty
 - (c) 125 students across the subdisciplines
 - ★ (d) Student affair Officer: Ms. Patricia Berumen
 - **Freshmen Year: Foundations in math, chemistry, physics and computing that are common to all engineers**
 - **Sophomore Year: Specialization starting with basic courses in your subdiscipline**
 - **Junior Year: Core courses begin your chosen speciality**
 - **Senior Year: Electives to apply what you have learned in your junior year**
 - **The faculty advisors for the Engineering Science majors are:**

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- (a) Computational Engineering Science: John Verboncoeur, NE (johnv@nuc.berkeley.edu)**
 - (b) Engineering Physics: David Attwood, EECS (attwood@berkeley.edu)
Jonathan Wurtele, PHYSICS (wurtele@berkeley.edu)**
 - (c) Engineering Mathematics and Statistics: James Casey, ME (jcasey@me.berkeley.edu)**
 - (d) Environmental Engineering Science: James R. Hunt, CEE (hunt@ce.berkeley.edu)**
- **General advice:**
 - (a) You should try to get involved in student groups and research labs after your freshmen year. The Society of Engineering Sciences (SES) is the student society for your major, and you should plan on joining this organization.**
 - (b) The COE Website has quite a bit of information on student services, courses, etc.**
 - (c) Take 15 units per semester regardless of AP. Otherwise, it will be hard**

to finish your degree in 4 years. There are virtually no summer courses offered.

(d) If you have AP courses, then supplement your curriculum technical electives, related courses, humanities/social science requirements (these are in your packages).

- **Students have many levels of advising:**
 - (a) Student Services Office
 - (b) Your Faculty Advisor
 - (c) The College of Engineering (COE) advisors
 - (d) You should take advantage of these resources to help you with whatever academic issues you have throughout your career here.
- **The Bay Area has many offerings that have nothing to do with Engineering Science: Crissy fields, Stinson Beach, Tilden Park and Muir Woods, etc- Take advantage of them!**
- **Computational Engineering Science: This interdisciplinary program recognizes the growing importance of computation as a methodology**

for attacking complex scientific and engineering problems. Combined with mathematical modeling and experimental observations, scientific computation enables engineers and scientists to solve problems that are otherwise intractable. The Computational Engineering Science Program provides a solid foundation in mathematics, the sciences and engineering, and fosters skills required for modeling, simulating, and solving complex problems. The emphasis is on the computation of science rather than the science of computation (i.e., CES is not computer science). Students have the opportunity to select courses from a wide variety of disciplines (see the section on clusters). The program provides a sound basis for graduate studies in engineering and the applied sciences. Additionally, it nurtures skills that are needed in large-scale technological modeling and simulations relevant to research in industry and national laboratories.

The Program has four components: 1) building a broad base in the sciences, with biology, chemistry and physics courses

2) developing skills in analytical and computational modeling through theoretical and applied courses in mathematics and computer science

3) building depth with engineering or science minors or clusters

4) applying computational and analytical tools to engineering or applied

science projects Information on the curriculum for Computational Engineering Science is available in the Announcement of the College of Engineering. For more information, e-mail ces-program@coe.berkeley.edu

- **Engineering Mathematics and Statistics:** This interdisciplinary program offers students an opportunity to study pure and applied mathematics as essential components of modern engineering. Choosing among pure mathematics, applied mathematics, statistics, and engineering allows the student to individualize a program of study in theory or applications or both. The program provides a broad foundation for graduate studies in theoretical branches of engineering, as well as in mathematics or statistics. Information on the curriculum for Engineering Mathematics and Statistics is available in the Announcement of the College of Engineering.
- **Engineering Physics:** This program interweaves the fundamentals of classical and modern physics, chemistry, and mathematics with engineering applications. A great strength of the program is its flexibility. The firm base in physics and mathematics is augmented with a selection of engineering course options that prepare the student to tackle the complex problems faced by society. Because the program emphasizes science and

mathematics, students are well-prepared to pursue graduate studies in physics or engineering. With the proper choice of electives, the program also enables a student to transfer to a more traditional field of engineering should such an interest develop. Information on the curriculum for Engineering Physics is available in the Announcement of the College of Engineering.

- **Environmental Engineering Science:** This is a multidisciplinary field requiring an integration of physical, chemical, and biological principles with engineering analysis for environmental protection and restoration. The program incorporates courses from many departments on campus to create a discipline that is rigorously based in science and engineering, while addressing a wide variety of environmental issues. Although environmental engineering options exist in the Chemical Engineering, Civil and Environmental Engineering, Mechanical Engineering, and Materials Science and Mineral Engineering departments, the engineering science curriculum provides a more broadly based foundation in the sciences than is possible in these departments. The major prepares the student for a career or graduate study in many environmental areas. Information on the curriculum for Environmental Engineering Science is available in the

Announcement of the College of Engineering.