University of the Pacific

School of Engineering

Sacramento Stockton San Francisco
Pacific’s Profile

**Official Name**
University of the Pacific

**Nicknames**
“Pacific” or “UOP”

**Areas of Study**
More than 80 majors and programs in:
- Arts, Humanities and Sciences
- Business
- Dentistry
- Education
- Engineering
- International Studies
- Law
- Music
- Pharmacy and Health Sciences

**Enrollment by Campus**
Stockton
- Undergraduate: 3,093
- Professional
- Pharmacy: 625
- Graduate: 494
(Main Campus): 4,212
Sacramento
(Law School): 954
San Francisco
(Dental School): 443
Total University: 5,609

**Academic Statistics**
Average Class Size: 25
Student/Faculty Ratio: 14/1

**2001 Freshman Class**
Applied: 3,170
Enrolled: 730
Average GPA: 3.40
(4.0 scale, including 9th grade)
SAT-I Combined
Average: 1130
Number of states represented: 27
Number of countries represented: 12
Enrolled in Honors Program: 125

**2001 Transfer Class**
Applied: 560
Enrolled: 240
Average College GPA: 3.11

**Stockton Statistics**
Population: 250,000
Climate: Mild versions of all four seasons.
Average Summer high temps: mid-80s to mid-90s.
Average Winter low temps: mid-30s to mid-40s

**Location:**
In the heart of California’s Great Central Valley.
Forty-five minutes south of Sacramento.
Ninety minutes east of San Francisco.
Two hours from Yosemite National Park, Lake Tahoe, Marin County, and the Monterey Peninsula.

---

**Engineering: The Programs**

This booklet is primarily about Pacific’s School of Engineering, but also contains information about Computer Science and Computer Information Systems. If you have any questions after reviewing this material you may contact:

- School of Engineering
  - (209) 946-2151 or gmartin@uop.edu
- Visit our website at www1.uop.edu/eng/index.html

You may also contact the Office of Admissions for the University of the Pacific by:
- Calling (800) 959-2867 or (209) 946-2211
- E-mailing us at admissions@uop.edu
- Visiting our website at www.uop.edu

**Programs that are covered in this booklet:**

**Bachelor of Science**
- Bioengineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Engineering Management
- Engineering Physics

**Minors**
- Engineering Management
- International Engineering Technology (for non-engineering majors)

**Related Areas**
- Computer Science
- Computer Information Systems

**Special Programs**
- Engineering Industry Fellowship
- Accelerated Engineering Undergraduate Research
- MESA (Math Engineering and Science Achievement)
The Pacific Difference...

The School of Engineering provides a superior, student-centered learning environment which emphasizes close faculty-student interaction and cooperative education. This personal and professional combination prepares students who can excel in the engineering profession; are qualified to pursue advanced degrees; and possess technical knowledge, critical thinking skills, creativity, and ethical values. These skills and talents are needed for leadership in developing and applying technology for the betterment of society and sustaining the world environment.

Pacific's Engineering Program consists of three well-integrated parts:
1. Courses in mathematics, natural sciences, humanities and social sciences;
2. Engineering courses, which provide the specialized training for professional competence in engineering;
3. On-the-job experience through our guaranteed Cooperative Education (Co-op) Program.

Through this threefold program, theory and practice are interrelated, human problems and engineering come into sharp focus, and students find increased meaning in their studies.

Individual Attention

Our classes rarely exceed 25 students. The professors get to know their students through personal interactions rather than relegating responsibilities to teaching assistants.

Teaching Faculty

Our faculty members are hired based on excellent teaching records and a strong desire to teach. Research and outside consulting, although important, take second priority.

Cooperative Education

All of our students spend two semesters off-campus working for an engineering firm and performing practical engineering tasks. This is 12 months of paid, full-time, practical work experience. The average salary is well above $2,500 a month. Students work for companies ranging from small consulting firms to the Cisco Systems and General Motors of the world.

Career Guidance: During their Co-ops, our students find out first-hand how well their interests and aptitudes fit their career choices. If they discover that they do not enjoy their work on Co-op as much as they had imagined, they can easily change their major to a different discipline inside or outside of engineering.

Because they have only completed two years of academic classes before their first co-op, they can usually make a change without losing much, if any, credit.

Special Programs

Engineering Industry Fellowship

Pacific's Engineering Industry Fellowship (EIF), for freshmen and transfer students, opens doorways early for students pursuing the engineering profession.

Industry sponsors provide their student Fellows with full-time paid internships through
graduation when school is not in session, plus two full-time paid Co-op assignments. In addition, EIF students typically receive a $2,000 annual scholarship provided by industry sponsors. An industry mentor is assigned to the student by the company to provide personal support and guidance.

Accelerated Engineering Program

High achieving prospective engineering students can apply for the Accelerated Engineering Program (AEP) which allows students to complete a Bachelor of Science in Engineering degree and a full-year of paid, practical Cooperative Education, in just four years. To do so requires coursework during the summers before the sophomore, junior and senior years. Admission to this program requires the following:

- Minimum high school GPA of 3.5 (on a 4.0 scale)
- Minimum combined SAT-I score of 1350
- Completion of two college level courses including Calculus I, prior to the freshman year. (Advanced Placement Exam scores of 3+ can also fulfill this requirement.)

Students in the AEP should understand that this is an extremely rigorous program designed for the high-achieving, fast-paced student who is interested in increased academic intensity. AEP Scholars will also be given priority consideration for such distinguished academic opportunities as undergraduate research programs.

Undergraduate Research

The students and faculty of the School of Engineering are involved in conducting research in many different areas of science and engineering. Projects include predicting landslides, developing efficient and cheap solar cooking equipment, and building robotic heads for object recognition and motion tracking. Research is funded by the School, the University, and by grants from the public and private sector. Through these projects students gain an appreciation of the role of scientific research in practical engineering situations. They can also assess their interest in and ability to pursue graduate studies.

Facilities and Equipment

The School of Engineering’s excellent facilities occupy five centrally located buildings.

Baun Hall houses the Electrical and Computer Engineering laboratories and the Parsons Laboratory utilized by the Civil and Mechanical Engineering Departments for the study of engineering materials. The Parsons Lab features a dynamic materials testing system and a scanning electron microscope.

Anderson Hall includes a Computer Aided Engineering and Design (CAE/D) lab for use by all undergraduate engineering students, a workstation laboratory for upper-division students, and a digital systems design laboratory used by students in Electrical and Computer courses.

Khoury Hall includes laboratories for study of instrumentation, energy, soils and manufacturing systems.

Owen Hall houses a robotics laboratory, a 24-hour student workshop and a wood shop.

The Fluid Mechanics and Environmental Engineering Laboratory includes a fully equipped lab for experimentation in hydrostatics and hydrodynamics, and a tilting flume for the study of fluid flow.
MESA at UOP (Math Engineering and Science Achievement)

University of the Pacific is one of the only private universities in California with a MESA Engineering Program.

MESA programs help students with intellectual potential excel in school. These students primarily come from backgrounds that can be described as either educationally disadvantaged, or they are members of groups that have a history of low eligibility rates for college. The programs are specifically geared toward helping these students gain the skills needed to study and work in math, science or engineering fields.

Bachelor of Science

Bioengineering

is an exciting new field that melds pre-med coursework into an engineering curriculum. Graduates are exceptionally well prepared to apply to medical or dental schools, or to seek immediate employment as bioengineers.

The bio technology world has been exploding in demand. Tissue engineering, medical imaging, and technologies for non-invasive surgical procedures are just a few areas in the endless list of developing bioengineering fields.

Civil Engineering

is devoted to serving the general public through the application of traditional and modern high technology. The program is designed to introduce the student to many of the areas in which the professional engineer may work.

In addition to the broad-based civil program, the student can concentrate coursework in one of the following areas:

Environmental Engineering

deals with environmental concerns including planning and design of air and water quality facilities. The environmental engineer often is a leader for multi-discipline design teams which solve societal environmental problems.

Geotechnical Engineering

deals with foundation design for buildings, dams and bridges, slope stability to prevent slides, and engineering geology to evaluate the strength and load bearing capacity of soil and bedrock materials.

Structural Engineering

deals with the analysis, design and construction of buildings, bridges and other structures using the latest materials. Design considerations include gravity and lateral loads such as earthquake and wind loads.

Water Resources Engineering

deals with the supply, control, utilization, quality and quantity of water, including the design of dams, power plants, pumping plants and aqueducts.

Computer Engineering

is a broad field which encompasses all aspects of computers, including the design and application of both hardware and software. Career opportunities are diverse and are found in computer design, manufacturing, transportation, communication, research, education and management.

Pacific’s laboratories include state-of-the-art workstations, as well as standard test and measurement equipment. Students have easy access to all computer and laboratory equipment, and can conduct approved independent research.

Electrical Engineering

encompasses a wide range of topics, including computers, communication systems, automatic control systems, digital systems, electronics, energy conversion, signal analysis, neural networks, fuzzy logic and integrated circuits.

Challenging employment opportunities are found in design, manufacturing,
Mechanical Engineering is a very broad engineering discipline. Consequently, mechanical engineers are typically found engaged in a diverse range of activities including product development, plant design, machine design, basic and applied research, environmental control, materials and manufacturing, robotics, and technical sales.

Mechanical engineers are employed by virtually every industry that uses engineers, such as public utilities, aerospace, consumer products, nuclear power, food processing, automotive, or materials handling.

Also, because of its broad basis, some people obtain a degree in Mechanical Engineering and then enter another field such as business, law, medicine or other activity where a good technical background is advantageous.

Although many specialties exist within mechanical engineering, two major areas are often described:

Mechanical Systems or Applied Mechanics, which includes engineering problems related to machine parts, structures, systems, and devices where considerations of motion, wear, fatigue, vibration, stress, material selection, strength or safety are important.

Energy Systems or Thermal Sciences, which includes conversion of energy into various forms, power devices, and engineering problems involving the transfer of heat and the flow of gases and liquids.

Engineering Management is offered to provide academic preparation for individuals who plan a management career in a technically related field. Engineering Management deals with the planning, organization, scheduling, monitoring and control of engineering projects. Engineering Management serves as an excellent vehicle for any of the following careers:

Technical Marketing, interfacing between engineers who design a product and the public who will need to understand what problems it solves and how it is used;

Construction Management, interfacing between the engineers who design a project and the laborers who are building it; and

Technical Business Management, assuming general management responsibilities for a technical or engineering related company.

An MBA can also be earned after completing the BS in Engineering Management by taking one additional year of coursework at Pacific.

Engineering Physics is offered in cooperation with the College of the Pacific’s Department of Physics. The School of Engineering grants the degree, and the student has an academic adviser in both departments.

Engineering Physics is primarily for the student with a strong interest and aptitude in the application of science and
mathematics to practical problems in engineering. Courses are taken in physics but the program includes classes from all the engineering fields including numerous laboratories which provide a strong design component. Consequently, the curriculum provides students with extensive and in-depth preparation in physics, mathematics and engineering, as well as the required co-op program.

Students who major in Engineering Physics work in areas where technology is changing rapidly, where traditional fields overlap, and in areas of research in applied physics and engineering. Salaries for our graduates are at the top of the engineering scale.

**Minors**

**Engineering Management**

Industry and the engineering societies encourage the acquisition of management skills because the average engineering student will be involved in some aspect of management within three to five years of graduation.

The minor in Engineering Management is for those who desire an understanding of management concepts and want to develop basic engineering management skills. To earn this minor, students must fulfill all of the requirements for a major in one of the engineering disciplines. They must also complete 20 units in the Engineering Management area including a prescribed set of core courses.

**International Engineering**

Our “global village” is becoming increasingly integrated, and international communications are now almost instantaneous. The professional who can operate in a multinational setting is a step ahead.

Students taking this minor complete 15 units in internationally oriented courses, have proficiency in a foreign language at the second semester level, and perform one of their Co-ops abroad.

**Technology (for non-engineering majors)**

The Technology minor provides an introduction to various aspects of engineering and technology which will strengthen a non-engineering student’s employment qualifications. As “technology” has become so prevalent in our lives and careers, more and more companies are demanding that their employees have a working knowledge in areas such as design, graphics, communications, software and hardware.

Pacific offers a number of engineering and technology-related courses which are basic enough that non-engineering students can feel confident in successfully completing them.

**Related Areas**

**Computer Science**

UOP’s Computer Science Department is committed to providing a strong undergraduate education that:

- Prepares students to enter the profession
- Provides a basis for continued study and growth
- Provides an understanding of the relationship of computers and computing to today’s society.

The Computer Science major provides a strong background in the theory and practice of computer science.

This major includes coursework in computing theory, data structures and algorithms, software design, application and windows programming, network programming with Java and database systems.

The Computer Science minor provides students with an introduction to technology, networking, computer systems and environments, and databases.

**Computer Information Systems**

The CIS major includes the core and foundation courses that provide the essentials of the Computer Science program with applications to business systems. It also includes courses in applications programming, business, and support courses in mathematics, economics and English.

For more information, please contact the Department of Computer Science at (209) 946-2655.