

Senior Design

Santa Clara's undergraduate engineering program culminates in a year-long sequence of senior design courses. Student teams take industry or student-motivated engineering projects from conception through design and analysis to construction and test. This capstone program exposes students to actual engineering practice emphasizing teamwork and complex systems. Examples include undersea remotely operated vehicles (ROV), terrestrial robots, and solar arrays that move to follow the sun. A highlight of the academic year, the Senior Design Conference affords students an opportunity to present their projects before a panel of alumni and other invited industry judges.

Solar Decathlon

Mechanical engineering students took part in designing and constructing SCU's third-place finishing entries in the U.S. Department of Energy's 2007 and 2009 Solar Decathlon competitions. They will contribute again for the 2013 entry (www.solardecathlon.org).

The 2009 Solar Decathlon house is located on campus and functions as a living laboratory for sustainability research for SCU students and faculty.



Faculty

Mohammad Ayoubi, assistant professor, Ph.D., Purdue University. *Expertise:* nonlinear dynamics, spacecraft dynamics, control, and optimization

Drazen Fabris, chair, associate professor, associate director, Center for Nanostructures, Ph.D., University of California, Berkeley. *Expertise:* theoretical, analytical and experimental fluid mechanics

Timothy K. Hight, associate professor, Ph.D., Stanford University. *Expertise:* design, finite element analysis, biomechanics, sustainability

Christopher Kitts, associate professor, Ph.D., Stanford University. *Expertise:* engineering design, space systems, robotic control

Hohyun Lee, assistant professor, Ph.D., Massachusetts Institute of Technology. *Expertise:* nanoscale transport phenomena, materials characterization and instrumentation, renewable energy, water purification

Godfrey Mungal, professor, dean, School of Engineering, Ph.D., California Institute of Technology. *Expertise:* turbulent reacting flows

Panthea Sepehrband, assistant professor; Ph.D., University of Waterloo. *Expertise:* computational materials, atomistic modeling, materials for energy-related applications, materials characterization

Terry E. Shoup, professor, Ph.D., Ohio State University. *Expertise:* computer methods for mechanical engineers, design optimization, kinematics, machine design, biomechanics

For further information, please contact

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Mechanical Engineering



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Mechanical Engineering



Mechanical engineering is essential to the proper design and manufacture of nearly every physical product or device in our modern world.

Mechanical engineers work with material properties, understand the nature of forces, predict the flow of heat and fluids, and design products to improve people's lives. Mechanical engineers work in design and analysis, product development, teaching and research; they even become high-level managers such as the CEOs of IBM, Hewlett Packard, and Chrysler. In a broad sense, mechanical engineers are problem-solvers. An education from Santa Clara University prepares our students to tackle challenging problems, making a positive impact on society.

The Jesuit philosophy of Santa Clara University partners rigorous engineering coursework with critical thinking, a focus on justice, and responsible action. Santa Clara provides the perfect environment to support our students' personal and professional growth. Employers say our graduates are not only technically well-trained, but also have the communication and management skills that are essential to success in any career path.

Department of Mechanical Engineering

The Department of Mechanical Engineering offers a comprehensive education that combines hands-on learning, theory, and real-world applications to prepare students to be valued contributors to society. Our outstanding faculty, emphasis on values-based education, and focus on collaborative learning create an excellent environment for academic and personal growth. The Department of Mechanical Engineering offers bachelor's, master's, and Ph.D. degrees. The mechanical engineering undergraduate program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Our department prides itself on providing students with the necessary personal attention and guidance to realize their full potential. Smaller class sizes mean better student-to-faculty ratios and more one-on-one attention from professors. Our faculty are engaged in active research programs with graduate and undergraduate students. Their research has recently been supported by NSF, CEC, HP, NOAA, DOD, NASA/Ames, NREL, LLNL, and others. Our graduate program is closely tied to local industry, educating many working professionals as well as involving key industry technologists as adjunct lecturers. Active student chapters of the American Society of Mechanical Engineers and other engineering societies bring students into contact with practicing engineers and the engineering profession, and provide opportunities for socializing with their peers.

Undergraduate Curriculum Options

- Four-year B.S. degree
- Four-year B.S. with a co-op, including a six-month industry work experience or study abroad option
- Combined five-year B.S./M.S. program

Santa Clara's ideal location offers a unique opportunity for our students to acquire relevant work experience as well as income while studying toward their degrees. More than 100 high-tech Silicon Valley companies and government laboratories employ engineering students in the co-op program, either during alternate academic



terms or on a part-time basis, and many students start their careers with their co-op company.

Coursework emphasizes laboratory experience that provides opportunity for practical, hands-on experimentation in materials, nanomechanics, scanning electron microscopy, microscale heat transfer, instrumentation, manufacturing and CAM/P, heat transfer, fluid dynamics, dynamics and controls, and robotic systems. The School of Engineering's Design Center provides students with state-of-the-art software and computing facilities.



Program Educational Objectives

Our program is committed to developing graduates who

- demonstrate their knowledge and depth of understanding of mechanical engineering in engineering practice and entry into rigorous graduate programs;
- design and lead development of components, systems, tests, or services that meet specifications in the context of economic, environmental, and societal requirements;
- work in a team environment, share their knowledge, expertise, and leadership;
- communicate effectively with colleagues, customers, subordinates, and managers;
- act ethically and professionally; and
- continue to learn and grow professionally and personally.