

# Civil Engineering



## Senior Design and Research

Undergraduate seniors undertake a comprehensive and intensive capstone project known as the senior design project. In-depth application of the skills learned during the preceding three years, from initial concept development through analysis, design, and report writing, replicates the process demanded of engineers in practice. For recent projects, students have designed buildings, bridges, and other public use structures; investigated landslides; and designed water and waste water remediation systems. 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.

Beginning with their sophomore year, undergraduates also have the opportunity to participate in research. Students have been actively involved in research that has advanced civil engineering practices ranging from light gauge steel construction to use of bamboo as a sustainable structural material.

## Co-op and Internship Programs

The School of Engineering's co-op education and internship programs help students acquire practical experience in their chosen fields, broadening their understanding of engineering practice, and increasing opportunities for employment and enhanced starting salaries. SCU's ideal Silicon Valley location affords outstanding co-op and internship opportunities.

## Study Abroad

Studying in a foreign country provides an unmatched experience, and while it may present a challenge for undergraduate engineering students, those with strong academic standing can spend one or more terms abroad and still normally complete their coursework and graduate within four years. Early, careful planning can make it happen!

## Accreditation

The civil engineering undergraduate program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

## After Graduation

SCU's mix of practical and theoretical experiences and our commitment to academic and ethical excellence cultivates outstanding engineers who are highly sought-after candidates for both higher education and employment. Our undergraduate students are well prepared to enter graduate civil engineering programs here at SCU or others across the country. Federal, state, county, and city agencies, as well as consulting engineering and construction firms provide a wealth of opportunities for SCU civil engineering graduates in a variety of fields.

Throughout their careers, Santa Clara civil engineering graduates use their technical expertise in a spirit of service, helping to build a better world from the ground up.

## Faculty

**Mark Aschheim**, chair, Peter J. Canisius, S.J. Professor, P.E., Ph.D., UC Berkeley. *Expertise:* earthquake-resistant structural engineering

**Steven C. Chiesa**, associate professor, P.E., Ph.D., University of Notre Dame. *Expertise:* environmental engineering, water supply and pollution control, biological processes for waste management

**Rong (Rachel) He**, associate professor, Ph.D., University of Wisconsin-Madison. *Expertise:* intelligent transportation systems, transportation network modeling, traffic simulation and analysis

**Edwin P. Maurer**, Robert W. Peters Professor, P.E., Ph.D., University of Washington. *Expertise:* hydrology, water resources, hydrologic modeling

**Hisham Said**, assistant professor, Ph.D., University of Illinois at Urbana-Champaign. *Expertise:* construction management and process modeling, sustainable built environment, infrastructure management

**Reynaud Serrette**, professor, Ph.D., Cornell University. *Expertise:* light-framed construction and design, seismic resistant design, steel structures

**Sukhmander Singh**, Nicholson Family Professor, P.E., G.E., Ph.D., UC Berkeley. *Expertise:* geotechnical engineering, liquefaction of silts, stability of sanitary landfills

## For further information, please contact

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# Civil Engineering



**Civil engineers plan, design, build, and maintain the facilities essential to our civilization: bridges, dams, highways, transit systems, airports, tunnels, irrigation systems, water supply, and industrial and commercial buildings.**

Civil engineering is one of the most enriching careers open to men and women—rewarding in personal fulfillment as well as in enduring service to their communities.

Today's society faces serious challenges dealing with finite nonrenewable resources, climate change, expanding population centers, and aging infrastructure systems. These issues can be successfully addressed with the direct involvement of civil engineers who are committed to the fundamental concepts of renewability, sustainability, livability, and safety.

## Our Program

For more than a century, SCU's Department of Civil Engineering has offered a comprehensive program for our students. Not only do we prepare our graduates for a career in civil engineering, but in the Jesuit tradition, we emphasize the need to make a positive contribution to the betterment of society and the human condition. A solid theoretical foundation, plenty of hands-on laboratory experience, and a curriculum that challenges students to think and act ethically help prepare our graduates to either continue with advanced study or enter the workforce.

We offer both bachelor's and master's degrees in civil engineering. Many of our undergraduates opt to participate in our combined B.S./M.S. program to earn both a bachelor's and a master's degree in as little as five years.

Our graduate program is designed to accommodate the needs of those interested in advanced study in the areas of construction management, structural engineering, or general civil engineering. Students have the option of pursuing the degree of Master of Science as either a full-time or part-time student.

The Civil Engineering Department prides itself on providing students with the necessary personal attention and guidance to develop their full potential within the context of their own experiences and expectations of the profession. Here, students find a dedicated faculty of teaching scholars who are committed to their students' success. A general open-door policy, scheduled office hours, and mandatory advising provide multiple opportunities for students to seek advice and discuss any issue with the faculty.

## Program Educational Objectives

The educational objectives developed by the department for its undergraduate program reflect our commitment to providing a program that produces graduates who, within five years of graduation, will

- capably build, design, maintain, or improve civil engineering-based systems in the context of environmental, economic, and societal requirements;
- serve the community as ethical and responsible professionals; and
- engage in lifelong learning for professional growth.

## Curriculum

Santa Clara University educates the leaders and innovators of the future. In keeping with our Jesuit philosophy, we cultivate exceptional engineers with integrity. Partnering rigorous engineering coursework with a core curriculum that encourages students to think critically and act responsibly, Santa Clara provides the perfect environment to support professional and personal growth. In addition to technical aptitude, Santa Clara University civil engineers develop excellent communication and management skills, essential to success in any career path.

Coursework includes laboratory experiences that provide opportunities for practical, hands-on experimentation to illustrate classroom concepts. The civil engineering department features laboratories for geology, surveying, geotechnical, environmental, structural, and hydraulics demonstrations and investigations. Both Windows and UNIX platform computer laboratories are available with industry standard software applications.



### Required courses

civil engineering materials  
engineering economics  
engineering hydraulics  
engineering mechanics  
environmental engineering  
geology  
geotechnical engineering  
municipal engineering  
reinforced concrete design  
steel design  
structural analysis  
surveying  
transportation engineering  
water resources

### Technical electives

advanced concrete design  
civil systems engineering  
cold-formed steel design  
construction engineering  
construction management  
earthquake engineering  
environmental systems design  
geotechnical design  
GIS in water resources  
groundwater hydrology  
structural systems  
sustainable construction  
sustainable water resources  
timber design  
traffic engineering design