College of Engineering

The College of Engineering at San Diego State University combines a top-notch teaching faculty with hands-on research and design facilities to produce engineers who will become leaders in the global marketplace of the 21st Century.

The College prides itself on teaching effectiveness and on attracting experienced faculty from all over the world. Recognized nationally as an outstanding research university, SDSU understands the importance of combining classroom education with practical research. Through ever-expanding research facilities and collaborations with the region’s foremost high-tech and construction industries, Engineering programs at SDSU provide students with the experience necessary to put theories into practice and to work successfully in a team environment.

SDSU’s Engineering students are an extremely diverse group, coming to the College from all backgrounds and parts of the world. The College is proud of its success as an urban research university in serving this diverse student body. For example, the College has been consistently recognized by outside organizations as one of the top engineering colleges for Hispanic students.

Academic Programs and Areas of Study

SDSU’s College of Engineering offers Baccalaureate, Masters and Joint Doctoral Degrees in numerous engineering disciplines.

Aerospace Engineering and Engineering Mechanics at San Diego State University is not only a unique discipline at SDSU, it is also one of only 50 aerospace programs in the United States. The program excels in research and teaching in traditional and modern Aerospace Engineering. It has exceptional facilities, such as the low-speed and high-speed wind tunnels and water tunnels, plus large computer clusters. Principal areas of research activity include aerodynamic design, computational aerodynamics, jet and rocket propulsion, fundamental fluid dynamics, and structural design and optimization. The program enjoys strong connections with the large, local aerospace industry in San Diego including Northrop Grumman, General Atomics, Lockheed Martin, and Navair. Alumni of the program have proven that students completing the aerospace engineering degree at San Diego State are well-rounded engineers who are successful in today’s industries.

Civil, Construction and Environmental Engineering at San Diego State University prepares students to apply engineering principles to improve the human environment. Students learn to design and supervise the construction of buildings, dams, roads, and bridges, and to plan and construct the complex systems that guarantee the sustainability of clean water supplies to cities, control floods, and perform other functions which ensure continued health and safety. The department offers outstanding curricula in six fields of engineering study: environmental, geotechnical, structural, transportation, construction, and water resources. State-of-the-art laboratory courses provide students with excellent opportunities for hands-on learning. With annual sponsored research of

Projects are an integral part of student success at SDSU
over $1.5 million and extensive involvement by local corporations, many students are involved in cutting-edge federal, state, and local projects. The College’s newest program, The J.R. Filanc Construction Engineering and Management Program, benefits from a close working relationship with the San Diego construction industry and provides students with frequent opportunities to be involved with local projects. The department sponsors active student chapters of American Society of Civil Engineers (ASCE), Chi Epsilon, Associated General Contractor (AGC), and others. Student chapters at San Diego State University have won many awards in regional and national competitions.

Electrical and Computer Engineering at San Diego State University enables students to learn the latest technologies in communication systems and theory, digital signal processing, optoelectronics and fiber optics, power systems and system stability, bioelectronics and rehabilitation engineering, RF and wireless communication circuits, digital circuits and systems, VLSI design, controls, multimedia communications, and computer networks. To meet the needs of engineers working in local industry, an interdisciplinary Master of Engineering program has been developed jointly with the College of Business and is available to all practicing engineers who are interested in engineering management careers. SDSU benefits from the explosion of the local San Diego telecommunication and biotechnology industries, offering students unique opportunities through internships and participation in industry-sponsored projects on campus. The department maintains close ties with many of the top local firms including QUALCOMM, Nokia, Ericsson, Motorola, IBM, Intel, Conexant, Northrop Grumman, Cubic, General Atomics, and many more.

Mechanical Engineering at San Diego State University provides practical, hands-on problem-solving experiences through a curriculum that is design-oriented. Mechanical engineers develop solutions to physical problems, question how things work, make things work better, and create ideas for doing things in new and different ways. It is perhaps the most diverse of engineering programs, with graduates employed in industries such as aerospace, automotive, biomedical, electrical, and petrochemical. This breadth of the mechanical engineering discipline offers students rewarding job opportunities in leading corporations. The hallmark of a mechanical engineer is creative design and problem-solving. San Diego State University’s Mechanical Engineering curriculum fosters creativity and innovation through hands-on experiences in designing, analyzing, and manufacturing products for today’s most progressive applications. Beginning with the freshman-year solid modeling design laboratory through the senior-level capstone design experience, mechanical engineering students at SDSU focus on the application of classroom knowledge. Students also participate in numerous national design competitions including the Formula SAE, Mini-Baja, solar-powered vehicle and the human-powered submarine.
Research Activities

SDSU has been designated as one of the top fifty research universities among all doctoral universities in the United States. This research-intensive environment means excellent research facilities and laboratories, a progressive learning environment for our students, and significant externally-funded research activities by our faculty.

The Communications Systems and Signal Processing Institute is engaged in educational, research, and service activities in the field of electronic communication systems, with an emphasis on radio frequency and digital signal processing aspects.

The Energy Engineering Institute has supported educational and research activities in energy-related areas and sustainability since 1985. Undergraduate and graduate students and faculty from the Mechanical Engineering and Electrical and Computer Engineering Departments are involved in obtaining solutions to problems presented by industrial sponsors.

The San Diego Center for Materials Research develops and promotes the interdisciplinary relationships needed to advance the state-of-the-art in materials research at the university, regional, national, and international levels. At SDSU, we have ongoing activities in a variety of important new technological areas including smart materials/structures, high-temperature materials, biomaterials, magnetorheological fluids, sensors, and coatings.

The Soil Erosion Research Laboratory is one of the premier soil erosion research centers in the county. Integrating key features of other soil erosion facilities across the United States, this indoor laboratory consists of a tilting soil-test bed, portable overhead rainfall simulators, and a water treatment and storage system. This facility is the only one of its kind on the West Coast.

SDSU’s College of Engineering also has a Chemical Oxidation Lab, Combustion Lab, Composting Lab, SDP Embedded Systems Lab, Energy Conversion Lab, Mechatronics Lab, Microbiology and Bioremediation Lab, Physical Electronics Lab, Powder Technology Lab, Soil Erosion Research Lab, Structures and Materials Lab, Virtual Engineering Lab, Water Quality Lab, and a Wind Tunnel, among others.

Community Relations and Outreach

The San Diego region has become internationally recognized as a world capital for wireless communications, biotechnology, unmanned aerospace vehicles (UAVs), software, and hardware development. The College of Engineering at SDSU has the privilege of partnering with leading industries in our region to enhance the quality of SDSU’s Engineering Program through collaborative student projects, internships and research affiliations. For example, the College’s Industrial Advisory Board includes members from world-class organizations such as QUALCOMM, Northrop-Grumman, SAIC, General Atomics, Cubic Defense, the U.S. Navy, and Sempra Energy.
Our Troops to Engineers Program is a pioneering initiative, supported by the National Science Foundation, to develop unique, practical solutions to assure successful transition of our military men and women to college and careers. Through this program SDSU’s College of Engineering offers special services to our veteran and active duty students, with the goal of developing a model for assimilating veterans that can be adopted on a national scale. Initiatives under this program include:

- Internships specially designed for veterans
- Counseling and academic support just for veterans
- Consideration of academic credit for military training

Project Lead the Way (PLTW), a signature project for SDSU’s College of Engineering and funded in large part through the QUALCOMM Institute for Innovation and Educational Success, is designed to address U.S. industry’s need for increasing numbers of qualified engineers. San Diego State University is the State of California Affiliated University for Project Lead the Way, a national program dedicated to expanding pre-engineering curricula in middle and high schools. Project Lead the Way has been successful in creating a dynamic partnership with our nation’s schools to prepare an increasing and more diverse group of students to be successful in engineering and engineering technology programs. Its curriculum is taught in more than 2,000 schools in 49 states, Canada and the United Kingdom. SDSU’s College of Engineering oversees training programs for PLTW teachers at three training site in California, and attracts teachers from all over the country to summer training institutes.

Through the MESA and MESA Engineering Program (MEP), SDSU’s College of Engineering plays a key role in one of the country’s most innovative and successful academic development programs: MESA (Mathematics, Engineering and Science Achievement). Since 1982, SDSU has offered the MESA program (middle and high school) and MEP (university level). MESA assists students at middle and senior high schools to excel in math and science and become competitively eligible for the most rigorous colleges and universities through a variety of after-school programs and teacher training.

The MESA Engineering Program (MEP) at SDSU’s College of Engineering provides a support system for students studying engineering. The program helps students succeed in a rigorous engineering curriculum, with the goal of graduating qualified engineers who have marketable skills for industry and/or graduate school. MEP provides support through a variety of activities, reinforced by peer communities. The rigorous academics, leadership preparation, out of classroom experiences and collaborative problem-solving approaches provided by the program result in highly skilled graduates. SDSU’s MEP program has been exceptionally successful in increasing the graduation rates of participating students, many of whom are the first in their families to attend college.