



SAN DIEGO STATE UNIVERSITY

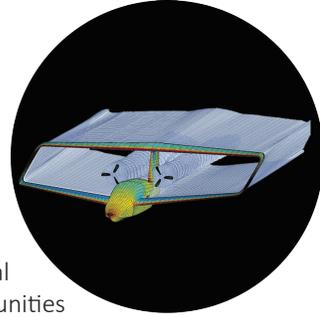
College of Engineering

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ACADEMIC PROGRAMS AND AREAS OF STUDY

Aerospace Engineering

The Bachelor of Science degree program in Aerospace Engineering at San Diego State University excels in teaching and research in traditional and modern Aerospace Engineering including a renewed emphasis on space. The program provides a rigorous curriculum that establishes a strong fundamental background and practical skills that successfully prepares our students for entry into the workforce or continuation of their studies. The Department has state-of-the-art experimental and computational facilities including low speed and supersonic wind tunnels and a water tunnel. Principal areas of study and research activity include aerodynamics, jet and rocket propulsion, aeroelasticity, structural design and optimization, guidance and control, and space flight mechanics. Many opportunities exist for students to participate in research and co-curricular activities such as the AIAA, Design Build Fly, and Rocket Project. The Department enjoys a close relationship with the local aerospace industry which is the major employer of our graduates.



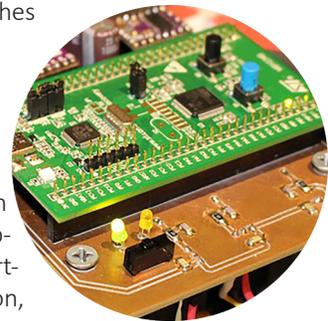
Civil, Construction & Environmental Engineering



The mission of the Department of Civil, Construction, and Environmental Engineering (CCEE) is to provide a high quality undergraduate and graduate education as well as advising and other support needed to ensure our students' academic success and preparation for a productive engineering career. Our three majors directly affect the well-being, health, and safety of all citizens as students learn to design and supervise the construction of buildings, dams, transportation systems, and water and waste water facilities. Our programs are based on strong, practice-oriented instruction, and student involvement where the Department values and cherishes our diversity in cutting-edge, externally sponsored research projects. Our students have won many awards in regional and national competitions. In addition, CCEE has excellent relations with the local industry which sponsor several professorial endowments and offer multiple internships and scholarships.

Electrical & Computer Engineering

The Electrical and Computer Engineering Department at San Diego State University teaches our students the latest technologies in communications, digital signal processing, optoelectronics, fiber optics, power electronics, power systems, bioelectronics, digital circuits, VLSI design, controls, multimedia, and computer networks. The strategic vision of the Department is to provide an education characterized by quality, access, and relevance. Students take a balanced set of courses to obtain a solid foundation in Electrical and Computer Engineering. The Department benefits from the explosion of the local San Diego telecommunication and biotechnology industries, offering our students unique opportunities through internships and industrial sponsored projects on campus. The Department maintains close relations with many top firms including QUALCOMM, Nokia, Ericson, Motorola, IBM, Intel, Conexant, Northrop Grumman, Cubic, General Atomics, and many more.



Mechanical Engineering



Mechanical Engineering at San Diego State University provides an education that seamlessly combines engineering theory, analysis, and practice. The curriculum is design-oriented and emphasizes the development of problem-solving skills through hands-on experience in various laboratories, and machine and fabrication shops. Our students are strongly encouraged to get involved in research projects. Participation in student organizations including ASME, Formula SAE, Baja SAE, and Mechatronics, and in national competitions that feature Formula One teams, solar-powered vehicles, and autonomous vehicles contributes to a vibrant educational experience. Graduates from the Department are well prepared to address contemporary challenges in automation and control, bioengineering, energy and sustainability, novel materials, powder technology, mechanics

of materials, robotics, and design and manufacturing. Our graduates are employed by aerospace, automotive, bio-medical, construction, energy, and manufacturing industries among others, and our alumni hold leading positions in both industry and government.

Bachelor's Degrees

- Aerospace Engineering
- Civil Engineering
- Computer Engineering
- Construction Engineering
- Electrical Engineering
- Environmental Engineering
- Mechanical Engineering
- Bioengineering Emphasis (in ME)

Minor

Engineering

Master of Science (M.S.) or Master of Engineering (M. Engr.) Degrees

- Aerospace Engineering
- Bioengineering
- Civil Engineering
- Electrical Engineering
- Environmental Engineering
- Mechanical Engineering

Certificate Program

Rehabilitation Technology

Doctoral Degrees with UCSD

- Engineering Sciences:
- Bioengineering
- Electrical & Computer Engineering
- Mechanical & Aerospace Engineering
- Structural Engineering

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San Diego State University
5500 Campanile Drive
San Diego, CA 92182-1326
Ph: (619) 594-6061

www.engineering.sdsu.edu

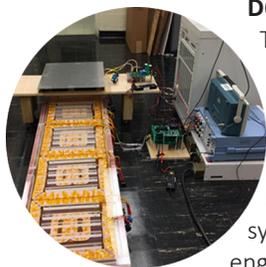
NSF Center for Sensorimotor Neural Engineering

The NSF Center for Sensorimotor Neural Engineering is conducting research on flexible microelectrode neural pads that can be implanted in the brain to record data and/or stimulate specific sites in collaboration with researchers at the University of Washington and MIT. The core contribution in this area is in developing a new class of sensing and stimulating electrodes based on patternable glassy carbon which is considered the gold-standard in electrochemistry. Novel fabrication techniques for integrating these electrodes with a flexible substrate and CMOS processes are being developed. The research integrates microfabrication, fluid dynamics, and biology. Related work is also conducted on microfluidic devices that can contribute to patient-specific therapies, including isolating stem cells from blood. A class 100 clean room facility is employed for much of the work.



DOE GATE Center for Electric Drive Transportation

The Center for Electric Drive Transportation (CEDT) was established in 2011 at the University of Michigan-Dearborn and was transferred to San Diego State University in 2015, with a grant from the U.S. Department of Energy's Graduate Automotive Technology Education (GATE) Program. The DOE's GATE initiative will award \$6.4 million over the course of 5 years to support 7 Centers of Excellence at American colleges, universities, and university-affiliated research institutions. As one of the seven university research centers that were awarded the prestigious grants, CEDT is dedicated to achieving synergy among technological development, research, and graduate education in automotive engineering. The CEDT's focus is on the development of electric drive transportation including power electronics, hybrid powertrain, wireless power transfer, and battery management.



NASSCO Ship Structural Testing and Analysis

Full-scale structural testing and analysis of 8' x 8' swaged steel ship panels is conducted in the SDSU Structural Engineering Laboratory. Pressed in swages add strength and stiffness to the steel panels and cost significantly less than welding on stiffeners. The lab has a unique, self-reacting test frame designed by Dr. Robert Dowell and his SDSU team; it can produce over one million pounds of applied force. This research is funded by NASSCO Shipyard and the National Shipbuilding Research Program (NSRP). Because of the success of the structural testing and analysis performed at SDSU Structural Engineering Laboratory, NASSCO has a long-term multi-million dollar cooperation plan with SDSU, which will bring better and more cost-effective shipbuilding technology to American shipyards.



Computational Physics Laboratory

The Computational Physics Laboratory studies explosions, blast waves, and multiphase reactive flows with applications such as the control of supersonic combustion in scramjets. Particle-laden blast waves involve complex physics that occur at widely disparate length scales. The goal of the laboratory's research is to develop a computational method that enables the predictive simulation of high-speed, particle-laden shocked flows and to analyze the environment in which particles, turbulence and shock waves co-exist.

The Powder Technology Laboratory

The Powder Technology Laboratory is currently involved in a variety of research projects on processing of powder materials including fundamental research on sintering and multi-scale analysis of various powder processing techniques. The projects conducted by the laboratory are based on experimentation and computational modeling of powder processing, including novel ceramic, metallic, and composite material synthesis with applications in fuel and solar cell technologies, fabrication of bio-implants, development of novel components for wireless devices, and 3D printing of complex shape powder parts.



Blue Gold Area of Excellence

The Blue Gold Area of Excellence combines campus-wide expertise in water research to address issues such as rapid urban growth, agricultural water transfers, extreme events, and cross-border issues, that impact water resources in water-scarce regions now, and in years to come. SDSU College of Engineering faculty, Drs. Natalie Mladenov and Alicia Kinoshita, have led efforts to study water quality and hydrologic response to restoration in urban watersheds, such as SDSU's Alvarado Creek on campus.



Professional Societies & Student Organizations

- 3D for Everyone (3D4E)
- American Institute of Aeronautics and Astronautics (AIAA)
- Alpha Omega Epsilon (AOE)
- American Public Works Association (APWA)
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- American Water Works Association (AWWA)
- Associated General Contractors of America/Construction Management Association of America (AGC/CMAA)
- Aztec Baja - Society of Automotive Engineers (Baja SAE)
- Aztec Electric Racing - Society of Automotive Engineers (AER)
- Aztec Racing - Society of Automotive Engineers (Formula SAE)
- Aztec Robotic Technologies (ART)
- Biomedical Engineering Society (BMES)
- Chi Epsilon (XE)
- College of Engineering Student Council (CESC)
- Design Build Fly (DBF)
- Engineers Without Borders (EWB)
- Institute of Electrical and Electronics Engineers (IEEE)
- Institute of Transportation Engineers (ITE)
- Mechatronics
- National Society of Black Engineers (NSBE)
- Rocket Project
- Society of American Military Engineers (SAME)
- Sigma Gamma Tau (SGT)
- Sigma Phi Delta (SPD)
- Society of Asian Scientists and Engineers (SASE)
- Society of Hispanic Professional Engineers (SHPE)
- Society of Women Engineers (SWE)
- Tau Beta Pi (TBP)

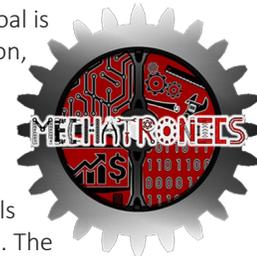
SUPPORT



The **SDSU Center For Student Success in Engineering (CSSE)** located in the College of Engineering Building, Room 221-B, offers an integrated range of services designed to help engineering students meet graduation requirements. Services include: peer advising, peer tutoring, internship support and study space. For more information, please e-mail: cssengineering@sdsu.edu

EXTRACURRICULAR ACTIVITIES

The **SDSU Mechatronics Club** is a student organization whose goal is to create an environment that not only promotes STEM education, but does so in a way that provides students with hands-on experience building autonomous robots within a team. The SDSU Mechatronics Club is broken down into three divisions: Apprentice Program, RoboSub, and RoboAir. All three divisions provide students with a diverse educational habitat in which to build skills in engineering, time management, and team-based cooperation. The Mechatronics Club is an interdisciplinary organization comprised of world-class electrical, mechanical, software, and business teams that work in conglomeration to compete in global competitions and promote STEM education at San Diego State University, the United States of America, and the world.



Student members of the **Rocket Project** design, build, test, and fly advanced rockets. Since its inception in 2003, students have successfully tested and launched multiple rockets, including liquid propellant, hybrid and solid rockets, to altitudes over 12,000 feet. Students learn manufacturing techniques, systems and ground testing, electronics and avionics, structures, design and analysis, aerodynamics, recovery systems and more.

Aztec Racing (Formula SAE) is a student organization that builds race cars and participates in a national competition organized by the Society of Automotive Engineers (SAE) International. The race cars are built over a period of about a year and the team effort provides real-world experience to students preparing to enter the engineering workforce. All aspects of engineering practice, including design, manufacturing, testing, marketing, management, and finances are integrated into the competition. The organization is built around a concept of a fictional manufacturing company.



The **Pacific Southwest Conference** is **ASCE's (American Society of Civil Engineers)** annual student chapter competition to test a variety of university students on their civil engineering skills. At the Conference, there are many different competitions such as the Concrete Canoe designed to test their ingenuity, knowledge of engineering subjects, and physical mettle. For the Concrete Canoe Competition, students have to design and fabricate a buoyant canoe made of concrete.

Mathematics Engineering Science Achievement (MESA)

Mathematics Engineering Science Achievement (MESA) supports students to become the engineers and scientists urgently needed in the U.S. Since 1982, SDSU's College of Engineering has partnered with MESA and shares MESA's vision to see California's



STEM Workforce reflect the diversity of its population. MESA is uniquely positioned to provide support at all educational levels from middle school through degree completion and works closely with industry. The program's success comes from a combination of: academic support, project based learning, supportive student communities, career preparation, industry exposure and alumni engagement. This statewide program serves over 24,000 college prep, community college and university level students throughout California. MESA is nationally recognized for its innovative and effective programming in STEM fields; and its long history with industry and its vast network of alumni are key components.

SDSU Women in Engineering



The **SDSU Women in Engineering Program** (including the **Femineer® Program**) responds to the nation's need for more female STEM professionals by providing K-12 students with 3-years of project-based curriculum in Creative Robotics, Wearable Technology, and Pi Robotics. The Femineer® Program also provides K-12 students access to engineering mentors and opportunities to visit a Femineer® affiliate university, while building a sustainable program and community for current and future STEM leaders. SDSU hosts an annual Femineer® Summit for current Femineer® students to showcase their projects, network with SDSU faculty and staff as well as local STEM professionals, and participate in tours of Engineering labs. The SDSU Women in Engineering team oversees summer teacher trainings, year-round professional development for teachers, industrial and private sector partnerships, and general support for the Femineer® schools locally and throughout the nation. Additionally, they provide student scholarships, STEM summer camps, as well as other STEM opportunities for students throughout the year.



Troops to Engineers



The **Troops to Engineers (T2E) Program** is a unique program currently offered only at SDSU for veteran students in undergraduate and graduate engineering programs. This program provides custom career assistance for students seeking to improve their professional development skills, find a paid internship and secure an engineering specific job upon graduation from SDSU. The T2E Program is funded by Northrop Grumman and Boeing and has been successfully growing since 2011. Students who participate are provided with exclusive support opportunities, including: professional network events, interview preparation, resume building, recruiting events, student tours at engineering facilities, mentoring, tutoring and connecting with SDSU and T2E Alumni and many more. For more information, please e-mail: Troops2Engineers@sdsu.edu

Diversity, Equity & Inclusion

The **American Society for Engineering Education (ASEE) Diversity Recognition Program** has granted the SDSU College of Engineering the Bronze Level Award with exemplar status for 2019-2021. This program is a national effort to publicly recognize engineering and engineering technology schools and colleges for their success in building a diverse workforce with diversity, equity and inclusion at the forefront.



Ways to Give to SDSU Engineering

Recognized for its world-class education, innovative programs, pioneering research and hands-on Capstone Design Program, the College relies on philanthropic support for students, faculty, student organizations, and research.



- Join the Dean's Giving Circle by making an annual gift of \$1,500
- Participate in the Engineering Challenge
- Sponsor a Capstone Project
- Participate in the Annual Day of Giving
- Establish an Endowment
- Make a Planned Gift
- Utilize Corporate Matching Gift Programs

For more information, please email: urd-engineering@sdsu.edu