College of Engineering

Administration

Dean: David T. Hayhurst

Associate Dean: Gordon K. F. Lee

Assistant Dean for Student Affairs: Bruce D. Westermo

Director of Doctoral Programs: Gordon K. F. Lee

General Information

The College of Engineering was established as a distinct unit of the university in 1958, although first courses named "Engineering" appeared in the 1922-23 catalog. The 1942-43 catalog was the first to announce the establishment of a "General Engineering" program leading to the Bachelor of Arts degree. The college is now organized into the Departments of Aerospace Engineering and Engineering Mechanics, Civil and Environmental Engineering, Electrical and Computer Engineering, and Mechanical Engineering.

At the undergraduate level, the College of Engineering prescribes certain patterns of its courses, combined with those of other academic divisions of the University, leading to the Bachelor of Science degree in six specific major fields of engineering. At the graduate level, the college offers the Master of Science degree in four of these fields and in bioengineering, a Master of Engineering degree in manufacturing and design, and a doctoral degree in engineering sciences/applied mechanics jointly with the University of California, San Diego.

Consistent with the role and mission of the California State University system, the faculty of the College of Engineering at San Diego State University believes its mission to consist of the following integrated components: To provide students with a quality undergraduate and graduate engineering education; to prepare graduates for professional careers and life-long learning; to promote the creation and dissemination of knowledge; to serve society through professional practice and community outreach; and to act as a catalyst for the technological development of the San Diego region.

Because the engineer's work is predominantly intellectual and varied, and not of a routine mental or physical character, this program places emphasis on the mastery of a strong core of subject matter in the physical sciences, mathematics, and the engineering sciences of broad applicability. Woven throughout the pattern is a continuing study of the social facets of our civilization, because engineering graduates must expect to find their best expression as leaders, conscious of the social and economic implications of their decisions.

Although the profession of engineering presents in practice a variety of specialties, undergraduate students initially focus their attention on a pattern of coursework emphasizing engineering fundamentals. Students then are able to apply this knowledge of fundamentals in developing special expertise in their areas of specific interest.

Accreditation and Academic Association

The College of Engineering is a member of the American Society for Engineering Education. Undergraduate engineering programs in aerospace engineering, civil engineering, computer engineering, electrical engineering, environmental engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission of the American Board for Engineering and Technology. A new program in construction engineering is being developed.

Registration of Engineers

Professional registration of engineers is required for many fields of practice. Engineering students are encouraged to take the Fundamentals of Engineering examination prior to graduation. Graduation from an accreditation program such as San Diego State University facilitates registration as a Professional Engineer.

Curricula Offered

Refer to the Courses and Curricula section of this catalog for a complete listing of program requirements and courses offered by departments within the College of Engineering.

Doctoral Program

Engineering Sciences/Applied Mechanics

Master's Degrees

Master of Science (M.S.)

Aerospace Engineering, Bioengineering,
Civil Engineering,
Electrical Engineering, Mechanical Engineering

Master of Engineering (M.Engr.)

Manufacturing and Design

Bachelor's Degrees

Aerospace Engineering (B.S.), Civil Engineering (B.S.),
Computer Engineering (B.S.), Electrical Engineering (B.S.),
Environmental Engineering (B.S.),
Mechanical Engineering (B.S.).

Minor

Engineering

Certificate Program

Rehabilitation Technology

Research Centers and Institutes

Communications Systems and Signal Processing Institute

Madhu S. Gupta, Director

This 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. Faculty, students, and industrial partners collaborate to advance the state-of-the-art in the institute's core areas of expertise, such as RF devices and integrated circuits, modems, receivers, transmitters, synthesizers, A-D and D-A converters, digital signal processing algorithms and hardware, antenna, and communication networks. Specific activities include research and design projects; development of products, software, algorithms, and techniques; and training programs including short courses.

Concrete Research Institute

M. Ziad Bayasi, Director

The Concrete Research Institute supports educational needs in civil engineering curriculum and concrete research performed for sponsors from industry and governments. The institute encompasses a wide range of topics. The main emphasis is currently on concrete materials and structures. Civil and environmental engineering faculty members are involved with finding optimum design solutions in bridges, seismic resistant structures, residential buildings, and retaining walls. The Web site is http://www.engineering.sdsu.edu/~sfrc/.

Energy Engineering Institute

Asfaw Beyene, Director

The Energy Engineering Institute has supported educational and research activities in energy related areas 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. Institute research projects cover a wide range of areas from optimizing energy resources to international energy studies. The Web site is http://www.engineering.sdsu.edu/energy.html.

Qualcomm Institute for Innovation and Educational Success

David T. Hayhurst, Geoffrey W. Chase, Lionel R. Meno, Co-Directors

The Qualcomm Institute for Innovation and Educational Success is a partnership between Qualcomm/SDSU. This partnership was formed to accomplish the following objectives:

- Significantly increase the technology skills of SDSU graduates, thereby generating a more qualified workforce and a better-informed citizenry.
- Develop an educational system that values, encourages, and rewards creative methods of delivering education, from kindergarten through college graduation.
- Establish the institutional infrastructure at SDSU to support large-scale change and transformation of the education system through innovation, evaluation, and dissemination of effective educational methods.
- Dramatically shift the way education is delivered, from kindergarten through college, with an emphasis on improving technology skills and knowledge.
- Develop cross-curriculum synergies among SDSU academic programs that help teach technology skills to students in all courses of study.
- Develop an effective, sleeves-rolled-up dialogue among Qualcomm, SDSU, and the greater San Diego business and corporate community, with the goal of addressing challenges, identifying opportunities, and generating responsive action.

The institute has the following five components:

- *Strategic Initiatives Board* to provide oversight to the partnership.
- *Improving Student Achievement in Mathematics Program* to increase student mathematics performance in public schools.
- *Project Lead the Way* to increase the number and diversity of qualified students entering the College of Engineering.
- *People, Information, Communication, and Technology Program* to increase the integration of technology with undergraduate students.
- *National Center for Urban Schools Transformation* will assist urban public schools to dramatically improve the level of student achievement.

San Diego Center for Materials Research

Ronald A. Kline, Director

Materials research, by its fundamental nature, is interdisciplinary. It directly involves expertise across departmental and college boundaries. The physical sciences (chemistry, physics), life sciences (biology, including biomaterials/biomechanics) and engineering (aerospace, biomedical, chemical, civil, electrical, mechanical, and nuclear). 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 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. The Web site is http://sdcmr.sdsu.edu/.