

Mechanical Engineering

In the College of Engineering

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The undergraduate program in Mechanical Engineering is accredited by the American Board for Engineering and Technology.

Faculty

Emeritus: Bauer, Bedore, Bilterman, Craig, Hoyt, Hussain, Lybarger, Mansfield, Morgan, Murphy, Ohnysty, Rao
Chair: May-Newman
Professors: Bhattacharjee, Kline, Olevsky
Associate Professors: Burns, Impelluso, May-Newman, Moon, Morsi
Assistant Professors: Beyene, Kassegne, Lambert, Yi
Adjunct: Cornwall, German

Offered by the Department

Doctor of Philosophy degree in engineering sciences/applied mechanics.
Master of Engineering in manufacturing and design.
Master of Science degree in bioengineering.
Master of Science degree in mechanical engineering.
Major in mechanical engineering with the B.S. degree.

Transfer Credit

No credit will be given for upper division engineering coursework taken at an institution having an engineering program which has not been accredited by the American Board for Engineering and Technology, unless the student successfully completes the first 12 units of engineering work attempted at this university. At that time, and upon recommendation of the department, credit will be given for the unaccredited work.

General Education

Students will complete a minimum of 50 units in General Education, to include a minimum of nine upper division units taken after attaining junior class standing. No more than twelve units may be used for General Education credit from any one department or academic unit. No more than 7 units from one department can be used in Sections II and IV combined (Foundations and Explorations), nor more than 10 units from one department in Sections II, III, and IV combined (Foundations, American Institutions, and Explorations).

I. Communication and Critical Thinking: 9 units

You may *not* use Credit/No Credit grades in this section.

1. Oral Communication (3 units)
2. Composition (3 units)
3. Intermediate Composition and Critical Thinking (3 units)

II. Foundations: 29 units

A. Natural Sciences and Quantitative Reasoning (17 units):

1. Physical Sciences (10 units)
Engineering students will take Chemistry 202 which includes a laboratory (4 units).
Physics 195 (3 units)
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2. Life Sciences (3 units)
3. Laboratory (satisfied under A.1. above)
4. Mathematics/Quantitative Reasoning
Engineering students will take Mathematics 150, 4 units applicable to General Education. You may *not* use Credit/No Credit grades.

B. Social and Behavioral Sciences (3 units)

C. Humanities (9 units)

Complete three courses in three different areas. One of these courses and the one under IV.A. below must be taken in the same department.

III. American Institutions: Three units of the six units of coursework which meet the American Institutions graduation requirement may be used in General Education, excluding courses numbered 500 and above.

IV. Explorations: Courses in this area must not be taken sooner than the semester in which you achieve upper division standing (60 units passed). Upper division courses in the major department may not be used to satisfy General Education.
Total: 9 units; must include one course of cultural diversity.

A. Upper division Humanities (3 units)

Three units must be taken from the same department as one of the Humanities courses selected in Foundations.

B. Upper division Humanities (3 units from a department not selected in A above.)

C. Upper division Social and Behavioral Sciences (3 units)

The Major

Mechanical engineers work on diverse, challenging problems that require the integration of science, engineering, and socioeconomic knowledge. 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. As a mechanical engineering student, you'll cover a broad scope of topics to prepare you for a successful engineering career.

Jobs in mechanical engineering include developing products to improve air and water quality, inventing more efficient energy sources, designing farm equipment to improve crop yield throughout the world, and developing systems for biological research as well as lifesaving medical equipment. A mechanical engineer, now more than ever, is someone who can translate scientific theories into the real products and processes to improve the quality of life.

Mechanical engineers are designers, and the program is dedicated to teaching engineering through the process of design. Design methodology and design projects are integrated throughout the curriculum, culminating in a capstone, design experience in the senior year where students are members of a design team.

The future depends on solving the worldwide problems of energy shortages, environmental pollution, world health, and inadequate food production. Mechanical engineers are actively involved in finding solutions for these problems.

Educational Objectives

The objectives of the mechanical engineering program are:

1. To instill in students an open minded but critical approach to the analysis of problems and design of systems, keeping in mind the technical, professional, societal, economic, and ethical dimensions of any solution.
2. To prepare students for successful careers and to have an appreciation of the need for life-long learning in a rapidly changing field.
3. To give students a significant exposure to the humanities and social sciences in order to broaden their appreciation of the world and provide an understanding of the role that engineering plays in society.

ME

Mechanical engineering students will graduate with the following abilities: a strong grounding in the fundamentals; knowledge of mathematics, science, and engineering; design and conduct experiments, analyze and interpret data; design a system, component, or process to meet desired needs; function on multidisciplinary teams; identify, formulate, solve engineering problems; understanding of professional and ethical responsibility; communicate effectively; understand impact of engineering solutions in a global and societal context; recognition of need for and an ability to engage in life-long learning; knowledge of contemporary issues; techniques, skills, and modern engineering tools necessary for engineering practice; apply advanced mathematics through multivariate calculus and differential equations; familiarity with statistics and linear algebra; work professionally in both thermal and mechanical systems areas including the design and realization of such systems; be computer literate and Internet competent; and knowledge of chemistry and calculus-based physics.

Major Academic Plans (MAPs)

Visit <http://www.sdsu.edu/mymap> for the recommended courses needed to fulfill your major requirements. The MAPs Web site was created to help students navigate the course requirements for their majors and to identify which General Education course will also fulfill a major preparation course requirement.

Mechanical Engineering Major

With the B.S. Degree (Major Code: 09101)

All students in mechanical engineering pursue a common program of basic sciences, engineering, and mechanical engineering fundamentals. The major consists of 49 upper division units. Students are provided with the opportunity to select a pattern of study to satisfy their areas of interest. This pattern of study is indicated in the sequence known as "professional electives" and may be selected from available courses in controls, energy conversion, gas dynamics, heat transfer, machine design, materials, thermodynamics, vibrations, and other areas.

Students must complete all upper division courses in the major within seven years prior to graduation. Students who will have completed any of those courses more than seven years before the projected date of graduation must contact the department chair for information about ways to certify knowledge of current course content.

Preparation for the Major. Mechanical Engineering 101, 102, 203, 240, 241; Chemistry 202; Electrical Engineering 203 or 204; Engineering 280; Engineering Mechanics 200, 220; Mathematics 150, 151, 252; Physics 195, 196, 196L, 197. (48 units)

General Education. Engineering students must follow the specific General Education program outlined in this section of the catalog. Other general education requirements and limitations, as well as listings of specific General Education course electives are presented in the General Education section of Graduation Requirements for the Bachelor's Degree.

Graduation Writing Assessment Requirement. Passing the Writing Proficiency Assessment with a score of 10 or above or completing one of the approved upper division writing courses (W) with a grade of C (2.0) or better. See "Graduation Requirements" section for a complete listing of requirements.

Major. A minimum of 52 upper division units to include Mechanical Engineering 310, 312, 314, 330, 340, 350, 351, 452, 490A, 490B, 495, 514, 555; Civil Engineering 301; Engineering Mechanics 340, 341. Professional electives: Nine units of additional coursework may be selected from any 400- or 500-level mechanical engineering course or approved courses from other departments, with a maximum of three units at the 400-level.

Master Plan. The master plan provides an advising record for mechanical engineering majors and should be initiated by the student with their faculty adviser during the second semester of the freshman year. All students must comply with this requirement prior to enrollment in Mechanical Engineering 310. The master plan must be reviewed each semester with the faculty adviser before registration, and submitted to the Office of Advising and Evaluations the semester prior to graduation. All course substitutions must be approved by the department chair.

