

Aerospace Engineering and Engineering Mechanics

In the College of Engineering

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The undergraduate degree in Aerospace Engineering is accredited by the American Board for Engineering and Technology.

Faculty

Emeritus: Conly, Dharmarajan, Faulkner, Pierucci, Shutts, Wang
 Chair: Katz
 Professors: Katz, Narang, Nosseir, Plotkin
 Assistant Professors: Jacobs, Venkataraman

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 aerospace engineering.
 Major in aerospace 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 (11 units)
 Engineering students will take Chemistry 202 (4 units).
 Physics 195 (3 units)
 Physics 195L (1 unit)
 Physics 196 (3 units)
 2. Life Sciences (3 units)
 3. Laboratory (satisfied under A.1. above)
 4. Mathematics/Quantitative Reasoning
 Engineering students will take Mathematics 150, 3 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

The educational objectives of the aerospace engineering program are (1) To provide students with a comprehensive education in aerospace engineering with coverage of all major sub-disciplines. All students will receive an appropriate background in mathematics, science, and engineering fundamentals, and further studies in aerodynamics, structures, flight mechanics, stability and control, propulsion and aerospace design. (2) To provide students with preparation for careers in aerospace engineering or related fields by emphasizing analysis and problem solving skills and fostering the following attributes: individual initiative, ability to work in teams, good communication skills, and ethical professional behavior. (3) To cultivate in students an appreciation for lifelong learning including graduate study and career paths in research and development.

The aerospace industry, the second largest industry in our country, is one of the largest employers of engineers. Opportunities for employment in entry level positions in large aircraft companies, general aviation manufacturers, or government aerospace-related laboratories are good. Graduates of the program are also qualified to continue their formal education at the graduate level or to accept entry level positions in several nonaerospace fields.

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.

Aerospace Engineering Major

With the B.S. Degree (Major Code: 09021)

Students majoring in aerospace engineering must include in their program a sequence of fundamental courses. In addition, the students have the opportunity to satisfy their particular areas of interest by selecting a pattern of study indicated in the sequence below. This pattern includes typical aerospace engineering topics, such as aerospace vehicle design, performance, structural analysis, aerodynamics, and propulsion.

The program below describes 136 units required for the degree. Each course specifically listed in the program is required.

Preparation for the Major. Aerospace Engineering 123; Engineering Mechanics 200, 220; Chemistry 202; Electrical Engineering 204; Engineering 280; Mathematics 150, 151, 252; Mechanical Engineering 101, 203, 240; Physics 195, 195L, 196, 197. (46 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 51 upper division units to include Aerospace Engineering 301, 302, 303, 310, 320, 403, 410, 430, 440, 460A, 460B; Engineering Mechanics 340, 341; Civil Engineering 301, 302; Engineering 510; Mechanical Engineering 352; and six units selected from one of the following areas of specialization:

Aerodynamics – Aerospace Engineering 530, 550, Engineering Mechanics 510.

Aerospace Structures – Aerospace Engineering 540, Engineering Mechanics 510, 530.

Propulsion and Flight Mechanics – Aerospace Engineering 520, 530, 540.

Other electives may be substituted with consent of the adviser and department chair.

Master Plan. A master plan including elective courses and area of specialization must be approved by the undergraduate adviser and filed with the Office of Advising and Evaluations during the first semester of the junior year.

Aerospace Studies

In the College of Professional Studies and Fine Arts

OFFICE: Exercise and Nutritional Sciences 385

TELEPHONE: 619-594-5545

Faculty

Chair: Fleck

Professor: Fleck

Offered by the Department

AFROTC curriculum.

Minor in aerospace studies.

AFROTC Curriculum

The department offers a three- or four-year Air Force Reserve Officers Training Corps program designed to develop officers who have broad understanding and high growth potential. For qualified students, two, three, or four-year scholarships are available in certain areas on a competitive basis. Scholarships pay full tuition at SDSU and various laboratory, textbook, and incidental fees plus a monthly nontaxable allowance of \$250-\$400 during the school year. Cadets participate in dialogues, problem solving, and other planning activities designed to develop leaders and managers. All coursework is done on campus with the exception of field trips and one field training encampment conducted at a military base.

Either a four- or six-week field training camp is required for all students during the summer between the sophomore and junior years. The four-week camp is for students who have completed all AFROTC lower division courses with a grade of "C" or better in each course. Field training emphasizes military orientation for the junior officer and aircraft and aircrew familiarization. Cadets receive physical training and participate in competitive sports. They observe selected Air Force units perform everyday operations, and they are trained in drill and ceremonies, preparation for inspections, and the use of weapons. Upon completion of the AFROTC program and all requirements for a bachelor's degree, cadets are commissioned second lieutenants in

the Air Force and serve a minimum of four years active duty. Graduates go on active duty in a specialty consistent with their academic major, their desires, and existing Air Force needs. Graduates may request a delay from entry on active duty to continue their education or may apply for Air Force sponsored graduate study to begin immediately upon entry on active duty.

Applying for the Program

SDSU students enroll in aerospace classes by signing up for courses in the same manner as other university classes. There is no advance application needed for the freshman or sophomore (AS100/200) classes. However, an orientation program, held just prior to the start of each term, is recommended and designed to give new cadets a broad, realistic introduction to Air Force officer training and provide them with helpful, important information on meeting academic requirements. Contact the Aerospace Studies Department as early as possible for additional information and sign-up procedures. The last two years of AFROTC (AS300/400) lead to the commission as a second lieutenant for which students must apply during the sophomore year. The application process involves taking the Air Force Officer Qualification Test (AFOQT), a physical examination, a physical fitness test, and a personal interview. Students from other institutions in the San Diego area are eligible to take AFROTC and should check with the department to obtain enrollment procedures. Veterans who can be commissioned by age 35 are also eligible for the program.

Aerospace Studies Minor

The minor in aerospace studies consists of a minimum of 15 units in aerospace studies, 12 of which must be upper division.

Courses in the minor may not be counted toward the major, but may be used to satisfy preparation for the major and general education requirements, if applicable. A minimum of six upper division units must be completed in residence at San Diego State University.