

Aerospace Engineering, B.S.

Program Educational Objectives: Graduates of the program will have the professional and scientific education that allows them to be successful as career engineers and in graduate programs. Specifically, they will be able to (1) function in professional environments in industry, government, and academia applying and building upon engineering science knowledge, problem-solving skills, and communication skills; (2) function as members of teams and in leadership roles applying ethical and inclusive standards including the AIAA code of ethics within and beyond traditional Aerospace Engineering disciplines; and (3) remain current with technology and contemporary scientific, environmental, and societal issues, and consequently improve skills and knowledge through a lifelong process of learning. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Aerospace Engineering curriculum includes a core of mathematics, physics, and chemistry. Engineering courses in fundamental areas constitute much of the remaining curriculum. A few technical electives allow the undergraduate student to specialize somewhat or to pursue broader understanding. A senior capstone design experience culminates the curriculum.

High School Students: See School admissions (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#undergraduatestudytext>) information.

Transfer Students: Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one course in general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit <http://assist.org>.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

All students must meet the University Requirements (<http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/>).

All students must meet the School Requirements (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#undergraduatestudytext>). (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#schoolrequirementstext>)

Major Requirements

Mathematics and Basic Science Courses:	
CHEM 1A	General Chemistry
or ENGR 1A	General Chemistry for Engineers
CHEM 1LE	Accelerated General Chemistry Lab
MATH 2A- 2B	Single-Variable Calculus I and Single-Variable Calculus II
MATH 2D	Multivariable Calculus I
MATH 2E	Multivariable Calculus II
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
PHYSICS 52A	Fundamentals of Experimental Physics
One additional General Education Category II course offered by the Schools of Physical Sciences, Biological Sciences, or Information and Computer Sciences.	
Engineering Topics Courses:	
Core Courses:	
ENGR 54	Principles of Materials Science and Engineering
ENGRMAE 10	Introduction to Engineering Computations
ENGRMAE 30	Statics
ENGRMAE 60	Electric Circuits
or EECS 70A	Network Analysis I
ENGRMAE 80	Dynamics

ENGRMAE 91	Introduction to Thermodynamics
ENGRMAE 106	Mechanical Systems Laboratory
ENGRMAE 108	Aerospace Laboratory
ENGRMAE 112	Propulsion
ENGRMAE 130A	Fluid Dynamics I
ENGRMAE 130B	Fluid Dynamics II
ENGRMAE 130C	Fluid Mechanics III
ENGRMAE 136	Aerodynamics
ENGRMAE 146	Astronautics
ENGRMAE 150	Mechanics of Structures
ENGRMAE 150L	Mechanics of Structures Laboratory
ENGRMAE 157	Lightweight Structures
ENGRMAE 158	Aircraft Performance
ENGRMAE 159	Aircraft Design
ENGRMAE 170	Introduction to Control Systems
ENGRMAE 175	Dynamics and Control of Aerospace Vehicles
Technical Elective Courses:	
<p>Students select a minimum of 12 units of technical electives. For students majoring in both Aerospace Engineering and Mechanical Engineering, a core course in one major cannot be counted as a technical elective in the other major. Any upper-division course in the department not used for the degree may be used as a technical elective. At least 4 units of technical electives must come from ENGRMAE upper-division courses and no more than 4 units of the technical electives should come from ENGRMAE 188, ENGRMAE 189, and ENGRMAE 199. With approval of the Undergraduate Advisor, students may choose from other departments' upper-division courses that have primarily technical content. Electives may be selected from the following:</p>	
ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II ^{1,2}
ENGRCEE 125	Transportation and the Environment
ENGRCEE 160	Environmental Processes
ENGRCEE 165	Physical-Chemical Treatment Processes
EECS 152A	Digital Signal Processing
EECS 152B	Digital Signal Processing Design and Laboratory
MSE 190	Materials Selection and Design
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
BME 121	Quantitative Physiology: Organ Transport Systems
STATS 67	Introduction to Probability and Statistics for Computer Science ²
COMPSCI 131	Parallel and Distributed Computing
MATH 112A- 112B- 112C	Introduction to Partial Differential Equations and Applications I and Introduction to Partial Differential Equations and Applications II and Introduction to Partial Differential Equations and Applications III
PHYSICS 111A- 111B	Classical Mechanics and Classical Mechanics
PHYSICS 112A- 112B	Electromagnetic Theory and Electromagnetic Theory
Engineering Professional Topics Course:	
ECON 20A or ECON 23	Basic Economics I Basic Economics for Engineers
ENGR 190W	Communications in the Professional World

¹ Both ENGR 7A-ENGR 7B must be taken to be counted as technical electives.

² ENGR 7A-ENGR 7B and STATS 67 are exceptions to the upper-division requirement for technical electives.

At most an aggregate total of 4 units of 199 or H199 courses may be used to satisfy degree requirements.

(The nominal Aerospace Engineering program will require 185 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Selection of elective courses must be approved by the student's faculty advisor and the departmental undergraduate advisor.

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
ENGRMAE 10	PHYSICS 7C	PHYSICS 7D
CHEM 1A or ENGR 1A	PHYSICS 7LC	PHYSICS 7LD
ENGR 7A*	CHEM 1LE	Basic Science
General Education	ENGR 7B*	
	General Education	
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
PHYSICS 7E	ENGR 54	ENGRMAE 91
PHYSICS 52A	ENGRMAE 60	ENGRMAE 130A
ENGRMAE 30	ENGRMAE 80	ECON 23 or 20A
General Education		
Junior		
Fall	Winter	Spring
ENGRMAE 130B	ENGRMAE 146	ENGRMAE 108
ENGRMAE 150	ENGRMAE 157	ENGRMAE 136
ENGRMAE 150L	General Education	ENGRMAE 170
ENGR 190W	ENGRMAE 130C	General Education
Senior		
Fall	Winter	Spring
ENGRMAE 112	ENGRMAE 106	Technical Elective
ENGRMAE 158	ENGRMAE 159	Technical Elective
ENGRMAE 175	Technical Elective*	General Education
General Education	General Education	

*ENGR 7A-ENGR 7B is a technical elective, available only to lower-division students in Fall and Winter quarters. Both ENGR 7A and ENGR 7B must be taken to count as a technical elective. If ENGR 7A-ENGR 7B is taken, this will replace one technical elective course in the senior year.

The sample program of study chart shown is typical for the major in Aerospace Engineering. This program is based upon a set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students should consult with their academic counselor to structure their program of study. Aerospace Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

- Mechanical Engineering, B.S.
- Biomedical Engineering, B.S.
- Biomedical Engineering, Minor
- Biomedical Engineering: Premedical, B.S.
- Chemical Engineering, B.S.
- Civil Engineering, B.S.
- Computer Engineering, B.S.
- Electrical Engineering, B.S.
- Environmental Engineering, B.S.
- Materials Science and Engineering, B.S.
- Materials Science and Engineering, Minor
- Mechanical Engineering, B.S.
- Software Engineering, B.S.