AEROSPACE ENGINEERING
Curriculum emphasizes engineering fundamentals (materials, solid and fluid mechanics, thermodynamics, computer modeling, computer-aided design, numerical analysis, and controls); aerospace topics (aerodynamics, aerospace structures, flight mechanics, dynamics and control of aerospace vehicles, orbital mechanics, and propulsion); and lab courses that integrate these fundamentals and topics through design of an aerospace system.

BIOENGINEERING
The use of scientific principles and classical engineering tools applied to biomedical problems. Topics include biomechanics, biotransport, bio-instrumentation, biomaterials, engineering design, and systems and organ physiology. The curriculum has some similarities to mechanical engineering. Graduates are prepared for jobs in the health care and medical device industries, or continue on to medical or graduate schools.

BIOENGINEERING: BIOINFORMATICS
An interdisciplinary program with Biology and Computer Science that emphasizes analysis, interpretation and integration of biological and bioinformatics data. Courses include molecular biology and genetics, evolutionary biology, models of disease processes, chemical systems, computer acquisition and management of big data, computational biology, and mathematical modeling and analysis. Graduates are prepared for employment in industries that manage and analyze biomedical data, and for advanced education in graduate and medical schools.

BIOENGINEERING: BIOSYSTEMS
Focuses on the organizational design and interaction of components of complex engineering and biological structures. Topics include analog and digital design, bioinstrumentation, signal processing, feedback control and regulation, imaging systems, biodynamics, and cellular and organ physiology. Emphasis is on the functional integration of multicomponent assemblages and their overall performance. Graduates are prepared for employment in the medical device industry and further study in graduate or medical schools.

CHEMICAL ENGINEERING
Prepares graduates for careers in a broad spectrum of areas in chemical, biochemical, environmental, and energy sectors. By specializing, students can prepare for careers in nanotechnology, environmental technology, microelectronic device fabrication, materials and polymer processing, pharmaceuticals and biotechnology, biomedical engineering, energy and thermal systems, and control and system engineering. The Chemical Engineering major is part of the NanoEngineering Department.

COMPUTER SCIENCE
Students gain core knowledge and skills in computational problem solving, algorithm design and analysis, and programming. They apply and deepen this core in courses taught by leading researchers in areas including artificial intelligence, computer security, computer systems, computer vision, cryptography, databases, graphics, human-computer interaction, machine learning, networking, robotics, software engineering, theory of computation, web development, and more. A strong peer tutoring program supports students with hands-on mentoring.

COMPUTER SCIENCE: BIOINFORMATICS
Prepares students for careers that involve the design of computational methods for understanding biological systems. Bioinformaticians deal with large and complex data sources arising from experiments that measure genomic variation, change in gene and protein expression, and other biochemical products, as well as the networks of interacting genes, proteins, DNA, RNA, and microbes that are active in a biological system. They use methods based on multiple strategies, including combinatorial algorithms, statistics, machine learning, and databases in their analyses, and help develop an integrated understanding of living systems.
COMPUTER ENGINEERING
Gives students a strong understanding of both hardware and software systems. After developing a foundation in mathematics, physics, electrical engineering, and computing, students then learn advanced concepts in algorithms, computer architecture, electronic systems, embedded systems, and software. A strong peer tutoring program supports students with mentoring. (Jointly administered by the Computer Science and Engineering, and Electrical and Computer Engineering Departments)

ENGINEERING PHYSICS
Provides a strong background in physics and mathematics, and is intended for students interested in applying theory to applied problems in acoustics, optics, continuum mechanics, and materials science. This Electrical Engineering major is administered in cooperation with the Department of Physics.

ELECTRICAL ENGINEERING
This major has a common lower division core structure followed by specialization in a depth sequence: Communication Systems; Electronic Circuits and Systems; Electronic Devices and Materials; Machine Learning and Controls; Photonics; Signal and Image Processing; or Computer System Design.

MECHANICAL ENGINEERING
Curriculum is focused on science and engineering fundamentals (mechanics, vibrations, thermodynamics, fluid flow, heat transfer, materials, control theory); programming and CAD; and mechanical design. Mechanical design includes freshmen conceptual design and drafting with 3D CAD programs, as well as senior capstone design with stress, dynamics, heat transfer or fluid dynamics analyses, and the optimization of the total system for superior performance and customer satisfaction. Students can choose to specialize in Renewable Energy & Environmental Flows, Robotics & Controls, Mechanics & Materials, or Fluids & Thermal Systems through advanced courses with small enrollment.

NANOENGINEERING
This multidisciplinary major is centered on nanoscale science and technology including the remarkable changes in biological, chemical, physical, optical, and electrical properties that occur when matter is reduced to nanometer sizes. This major includes coursework from basic sciences and multiple engineering disciplines and prepares graduates for careers in a broad spectrum of industries.

PROFESSIONAL DEVELOPMENT
At the Jacobs School of Engineering, professional and personal development opportunities are everywhere:
› Team Internship Program
› New co-op program pilot
› Institute for the Global Entrepreneur
› Gordon Center for Engineering Leadership
› IDEA Engineering Student Center
› STEM outreach
› Global TIES (engineering service learning)
› Research in world-class labs
› Envision Arts & Engineering Maker Studio
› Engineering competition teams

COURSE CATALOG
Consult the UC San Diego course catalog for official information on all majors:
https://catalog.ucsd.edu/front/courses.html