WALTER SCOTT, JR. COLLEGE OF ENGINEERING

Scott Bioengineering Building, Suite 202
(970) 491-3366
engr.colostate.edu (http://www.engr.colostate.edu)

Professor David I. McLean, Dean
Professor Anthony Marchese, Associate Dean

Undergraduate Majors
Biomedical Engineering
Chemical and Biological Engineering
Civil Engineering
Computer Engineering
Electrical Engineering
Engineering Science
Environmental Engineering
Mechanical Engineering

Interdepartmental Majors
Major in Engineering Science

Dual Degree Programs
Biomedical Engineering (B.S.) combined with Chemical and Biological Engineering (B.S.)
Biomedical Engineering (B.S.) combined with Electrical Engineering, Electrical Engineering Concentration (B.S.)
Biomedical Engineering (B.S.) combined with Electrical Engineering, Lasers and Optical Engineering Concentration (B.S.)
Biomedical Engineering (B.S.) combined with Mechanical Engineering (B.S.)
Engineering Science (B.S.) and International Studies (B.A.)
Interdisciplinary Liberal Arts (B.A.) and Engineering Science (B.S.)

Undergraduate Minors
Biomedical Engineering Interdisciplinary Minor
Environmental Engineering

For a complete list of departmental program offerings (including certificates), see individual department catalog pages.

College-Wide Graduate Programs

Master’s Programs
Master of Engineering, Plan C, Biomedical Engineering Specialization
Master of Engineering, Plan C, Chemical Engineering Specialization
Master of Engineering, Plan C, Civil Engineering Specialization
Master of Engineering, Plan C, Computer Engineering Specialization
Master of Engineering, Plan C, Electrical Engineering Specialization
Master of Engineering, Plan C, Engineering Management Specialization
Master of Engineering, Plan C, Mechanical Engineering Specialization
Master of Engineering, Plan C, Systems Engineering Specialization
Master of Science in Systems Engineering, Plan A
Master of Science in Systems Engineering, Plan B

Ph.D. Programs
Ph.D. in Systems Engineering

Graduate Certificates
Certificate in Systems Engineering Practice

The mission of the Walter Scott, Jr. College of Engineering is to provide high quality teaching, advising, research, outreach, and service in a land grant, Carnegie Class I environment and to serve the people and industries of the state, nation, and world.

Engineers are critically involved in every facet of modern technological society, processing information, designing systems and equipment, maintaining society’s infrastructure, solving environmental and energy problems, and helping attain desired levels of efficiency and comfort. The Walter Scott, Jr. College of Engineering continues its tradition—a tradition as old as CSU—of providing world-class training in the basic fields of engineering through both undergraduate instruction and graduate programs strongly supported by modern research facilities and distinguished faculty.

College Programs

The Engineering Accreditation Commission of ABET (http://www.abet.org) accredits all engineering undergraduate programs.

Undergraduate programs are administered by the Departments of Chemical and Biological Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, and Mechanical Engineering. These departments offer four-year programs leading to Bachelor of Science degrees. Although emphasis is on broad training in basic engineering, students may specialize to some extent by proper choice of technical electives. Additionally, the School of Biomedical Engineering offers a program in which students attain two degrees in five-years. Graduates of this program receive two degrees: one B.S. in biomedical engineering and the other B.S. in one of three traditional engineering areas: chemical and biological engineering, electrical engineering, or mechanical engineering.

A program leading to a Bachelor of Science degree with a major in Engineering Science is coordinated by the Associate Dean for Academic Affairs in the Walter Scott, Jr. College of Engineering. This program offers three concentrations: Engineering Physics, Space Engineering, Teacher Education, and two dual degrees offered through the College of Liberal Arts resulting in degrees in both Liberal Arts and Engineering.
Students may consider simultaneously completing the requirements for a second major. See Second Major Requirements for a complete description of the program. A student may pursue a minor program of study inside or outside the Walter Scott, Jr. College of Engineering in conjunction with the desired engineering major.

**Walter Scott, Jr. College of Engineering General Objectives and Outcomes**

**Outcomes**

Graduates of the undergraduate engineering programs will be able to:

- Apply knowledge of mathematics, science, and engineering.
- Identify, formulate, and solve engineering problems.
- Design and conduct experiments and analyze and interpret data.
- Design a system, component, or process to meet demand needs within realistic constraints.
- Communicate effectively.
- Function in multi-disciplinary teams.
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

They also shall have:

- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- A knowledge of contemporary issues.
- An understanding of professional and ethical responsibility.
- A recognition of the need for, and an ability to engage in, life-long learning.

**Objectives**

Individual program outcomes and objectives are provided within the respective departments’ websites and below, in this catalog.

**Cooperative Education Program**

The cooperative education program is an academic rotational program in which students work at least three semesters, two of which are fall or spring, in an assignment related to their major. Each work semester, cooperative education students register for one credit hour of Engineering Cooperative Experience to maintain their full-time student status. Three cooperative education credit hours may be substituted for a technical elective in their major. Cooperative education students gain at least a year of work experience, typically with the same employer, while earning a competitive salary. The cooperative education program allows participants to explore their chosen engineering discipline, build a powerful resume, develop a network of professional contacts, and support their academic expenses.

**International Opportunities**

Education abroad programs are available to students in the Walter Scott, Jr. College of Engineering. Because knowledge of other cultures is valuable in understanding our own, students are strongly encouraged to take a summer or semester to study outside the United States as part of their overall program at CSU. Students interested in study abroad should plan far in advance by discussing opportunities with their academic advisor and by visiting the Office of International Programs (http://international.colostate.edu) in Laurel Hall.

**Registration as a Professional Engineer**

Registration and licensing are required under certain legally defined circumstances in order to practice as an engineer. The Walter Scott, Jr. College of Engineering actively encourages all of its students to fulfill the necessary requirements as soon as they are eligible. The Fundamentals of Engineering Examination (FE) administered by the State Board of Registration for Professional Engineers and Professional Land Surveyors may be taken by seniors from ABET accredited programs during the two semesters prior to graduation. After the required practical experience is completed, the Principles and Practice of Engineering Examination (PE) may be taken for licensure in the engineering profession.

**Career Readiness**

Within the Walter Scott Jr. College of Engineering, the Engineering Success Center (http://www.engr.colostate.edu/engineering-success-center) provides comprehensive career services and career preparation as part of the Office of Academic and Student Affairs. The center delivers a full spectrum of programs supporting the professional development and placement of undergraduate engineers while considering the workforce needs of its industry partners. Student services include resume reviews, job search advice, career fairs, salary negotiation tactics, mock interviews, cooperative education partnerships, and the opportunity to engage with diverse student organizations.

**Admission Information**

Students may be admitted to a specific undergraduate major in this college or as undecided engineering freshmen (Engineering Open Option). Undecided engineering students must specify their choice of major prior to registration for the sophomore year. The demand for any engineering major exceed the capacity to maintain a high-quality education, the college may find it necessary to limit enrollment in some majors. The Engineering Open Option student who wishes to transfer to one of these majors may be at a disadvantage when demand exceeds capacity. In general, students are better served by selecting one of the college’s majors at admission and then changing majors, if necessary, rather than entering as undecided freshmen.

**High School Graduates**

See General Policies for Undergraduate Admissions for specific Walter Scott, Jr. College of Engineering requirements. The required units listed are minimums. Students desiring to enter the engineering majors are urged to take available advanced math, English, computer skills, and natural sciences classes.

**Course Placement and Advising for Freshmen**

All entering freshmen are required to take the Mathematics Placement Examination (MPE) (https://placement.math.colostate.edu/welcome/directory.html) prior to registration. The examination results, together with other information about students, are used by both professional and faculty advisors to counsel students. Those with weaknesses in mathematics may be advised to take up to five math courses (MATH 117, MATH 118, MATH 124, MATH 125, MATH 126) before enrolling in calculus (MATH 160).

**Transfer Students**

Advisors in each department are available to assist students who wish to transfer. Should the demand for any engineering major exceed the capacity to maintain a high-quality education, individual departments may find it necessary to enforce more stringent requirements.
Transfer of credits earned at other colleges and universities within Colorado is facilitated by the articulation agreements from one university to another on course equivalencies.

**Change of Major to Engineering**

Students who wish to change from another CSU major are selected for admission once each term; students are admitted based on academic criteria. Some majors may specify more stringent requirements in math and science or other courses. Engineering courses are normally open to engineering majors only.

**Curricular Requirements**

The curricula of the Walter Scott, Jr. College of Engineering include courses in engineering, mathematics, science, humanities, and social sciences. During the first two years, all engineering students take coursework emphasizing mathematics, physics, chemistry, and basic engineering, because all branches of engineering rely on this foundation. The junior and senior years are devoted primarily to a balanced selection of specialized engineering courses. The minimum number of credits for graduation with a Bachelor of Science degree varies with the engineering major.

Good engineers are not only competent to render professional service in their fields of specialization, but are able to assume leadership roles as citizens. To broaden students’ perspectives in non-technical areas, the programs in engineering require a minimum of 12 to 15 credits in arts and humanities and behavioral and social sciences to be selected from anthropology, economics, foreign languages, history, literature, philosophy, political science, psychology, and sociology. Courses in art, geography, music, speech, and theatre may also be selected with the prior approval of the advisor. These courses must be selected in such a way that they also meet All-University Core Curriculum requirements.

The ability to express oneself clearly and concisely in both written and oral forms is a great asset to the engineer who is often called upon to prepare reports in which clarity, organization, and precision are essential. For this reason, engineering students must do more than meet the minimum English course requirements. In fact, the development of communication skills is emphasized throughout the engineering curricula. This emphasis is especially evident in laboratory and design-oriented courses, in which the presentation of both oral and written reports is a major component.

The Walter Scott, Jr. College of Engineering requires a minimum grade point average of 2.000 in required engineering, mathematics, chemistry, and physics courses as a graduation requirement. Additional minimum grade requirements apply in some engineering majors.

An engineer applies physical understanding and analytical techniques to the design of devices and systems needed by modern society. The preparation of an engineer, therefore, must include engineering design experience. To meet this objective, all undergraduate engineering students must participate in a well-structured sequence of design-related courses culminating in a capstone design experience in order to graduate.

**Other Graduate Programs under the Walter Scott, Jr. College of Engineering**

The Walter Scott, Jr. College of Engineering also offers an M.S. and a Ph.D. in Systems Engineering, as well as graduate-level interdisciplinary studies programs in Extreme Ultraviolet and Optical Science and Technology, and Systems Engineering. Students interested in graduate work should refer to the Graduate and Professional Bulletin.