COLLEGE OF ENGINEERING

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The mission of the College of Engineering is to prepare students for global professional practice, for admission to advanced degree programs, for leadership in their public and private lives, and for life-long learning in their chosen professions. We promote discovery, development, and dissemination of knowledge through excellence in research, and provide quality academic courses and continuing education to enhance the capability of practicing professionals. Through our scholarly activity, we have the responsibility to be a major contributor to our state, region, and nation's economic and technology base, while contributing to the body of knowledge for an array of research topics.

Our vision is to be an engine of innovation that integrates student-centered academics, relevant research, and meaningful outreach that advances Idaho and beyond.

The Engineering Profession

Members of the engineering profession use their knowledge of mathematics and the sciences to create useful and economic devices, structures, and systems for the benefit of the earth and its inhabitants. The engineer's talents are used in many ways: design, construction, and operation of public works and utilities systems; planning, construction, and operation of industrial processes and equipment; application of technical products; and creation of devices and systems needed for the support of all human activity, such as food production, transportation, communication, and enhancement of the environment. Many engineers hold responsible managerial positions; others are key members of the interdisciplinary teams that solve the complex technical, economic, and social problems of the world.

The engineering profession recognizes that social, economic, political, and cultural, as well as technical considerations are involved in most of the works in which the modern engineer is engaged. A part of an engineer's education is devoted to the humanities and the social sciences to help relate the technical preparation received to the world today, and to enhance the engineer's role as an educated, responsible citizen.

To qualify as an engineer, one usually undertakes a four-year college program leading to a Bachelor of Science (B.S.) degree in one of the major branches of engineering practice. Bachelor of Science graduates may either go directly into engineering employment or proceed to graduate study to pursue a given area of interest in depth. As the technology of engineering includes a wide range of subject matter that can be explored only to a limited extent in undergraduate programs, more and more students undertake graduate study for better preparation in a specific field before seeking employment as practicing engineers.

All states require that engineers engaged in work affecting public health and welfare be licensed or registered. This requires a qualifying examination in the fundamentals of engineering, usually taken during the last year of undergraduate study, and a period of practical experience followed by a second qualifying examination in the practice of engineering. Many industries, while not legally required to use registered engineers, encourage registration as evidence of professional stature of their engineering employees.

The Computer Science Profession

Computer science is a discipline that involves the understanding and design of computers and computational processes. In its most general form it is concerned with the understanding of information transfer and transformation. Computer science is evolving rapidly and includes theoretical studies, experimental methods, and engineering design all in one discipline. In computer science there is an inherent intermingling of the theoretical concepts of computability and algorithmic efficiency with the modern practical advancements in electronics that continue to stimulate advances in the discipline. It is this close interaction of the theoretical and design aspects of the field that binds them together into a single discipline.

Because of the rapid evolution it is difficult to provide a complete list of computer science areas. Yet it is clear that some of the crucial areas are theory, algorithms and data structures, programming methodology and languages, and computer elements and architecture. Other areas include software engineering, artificial intelligence, computer networking and communication, database systems, parallel computation, distributed computation, computer-human interaction, computer graphics, operating systems, numerical and symbolic computation, and computer security.

A professional computer scientist must have a firm foundation in the crucial areas of the field and will most likely have an in-depth knowledge in one or more of the other areas of the discipline, depending on the person's particular area of practice. Thus, a well-educated computer scientist should be able to apply the fundamental concepts and techniques of computation, algorithms, and computer design to a specific design problem. The work includes detailing of specifications, analysis of the problem, and providing a design that functions as desired, is reliable and maintainable, and meets desired cost criteria. Clearly, the computer scientist must not only have sufficient training in the computer science areas to be able to accomplish such tasks, but must also have a firm understanding in areas of mathematics and science, as well as a broad education in liberal studies to provide a basis for understanding the societal implications of the work being performed.

Equal Opportunity

The degree programs of the college and the professions they represent actively seek out women and under-represented minorities. Opportunities are unlimited and an increasing number are entering the professions.

Preparation and Admission

A statement of undergraduate and graduate admission requirements is included in the admissions portion of this catalog. A student may be admitted with less than the requirements listed, but the deficiency must be made up before he or she can progress very far in a college engineering course of study.

Students who contemplate entering the College of Engineering with advanced standing from other institutions should complete as many of the freshman and sophomore requirements listed in the curricula as possible. Calculus, chemistry and physics and the various introductory engineering courses are prerequisites to many advanced courses, and their omission may delay graduation.

Students from out-of-state institutions who wish to transfer to a degree program offered by the College of Engineering are invited to apply. Those who's cumulative GPA is below 2.8 for all previous college-level courses,
including any courses taken at UI, may be admitted on approval of the
College of Engineering Admissions Committee.

Admission to Classes
As a prerequisite to any upper-division course normally taken in the
junior or senior year and offered by the College of Engineering, students
in the College of Engineering must have completed selected courses
from the required courses in chemistry, computer science, engineering,
mathematics, and physics that are normally to be taken by them during
their first two years, and must have attained a grade of C or better in each
of those courses.

Scholarships and Awards
Many scholarships and awards are available to College of Engineering
students and prospective students. See "Student Financial Aid Services
(https://catalog.uidaho.edu/student-services/student-services)" in the
student service section.

Faculty
The faculty is the key to the quality of the engineering program. All faculty
members in this college hold advanced engineering degrees and all but
four hold the Ph.D. degree. Recognition in such publications as Who’s
in America, Who’s Who in the West, Who's Who in Engineering, and American
Men and Women of Science is common.

A distinguishing feature of the faculty is a blend of academic and
practical experience. Many faculty members have extensive experience in
practice that they bring into the classroom, preserving a balance between
theoretical and practical aspects of engineering.

Facilities
The facilities of the College of Engineering are among the finest in the
country. Work is centered in the two-block-square engineering complex,
which includes the Allen S. Janssen Engineering Classroom Building, the
J. E. Buchanan Laboratory, the Gauss-Johnson Engineering Laboratory,
McClure Hall, and the Engineering/Physics Building. These facilities are
supplemented by biological engineering laboratories at other locations on
the campus. In total, more than 250,000 square feet of floor space is used
by the College of Engineering. Laboratories include modern equipment
for teaching and research in all areas of instruction with recent additions
for computerized drafting, CAD/CAM, computerized VLSI design, and
robotics. Some of the equipment is of advanced design found in only
a few institutional laboratories. Students also have access to over 20
general purpose open-access computer laboratories across the campus,
with over 600 computers. There are over 100 software applications
available, as well as the web, email, and other network services. An
assortment of desk-top minicomputers and engineering work stations are
available within the engineering complex. Wireless access is available in
all of the engineering buildings.

Standing and Advantages
With a tradition of excellence dating from the founding of the University
of Idaho, the College of Engineering has developed and maintained
engineering degree programs on the Moscow campus that are noted
for quality. For over 40 years, graduate programs in several disciplines
have been available at off-campus sites as well. Since 1896, when it
granted its first degrees, graduates of the college have spread throughout
the country that send interviewers to the campus each year seeking to hire
Idaho engineering graduates attest to the reputation of the university's
engineering program.

The size of the college is near the median of engineering colleges in the
country. While it is not so large that the importance of the student as an
individual is lost, it is large enough to support the faculty and facilities
needed for top quality education.

Attention is given to both undergraduate and graduate programs. New
concepts and knowledge resulting from the graduate program feed into
the undergraduate program to keep it up to date. Undergraduate students
have an opportunity to observe and/or contribute effort to graduate
research projects to help them determine their interest in graduate work.

Engineering Experiment Station
The function of the Engineering Experiment Station is to encourage and
coordinate the College of Engineering’s research and extension programs
that are integral parts of the college’s academic and service efforts.

The research program in engineering is conducted by the faculty, staff,
and students of the college. There is neither a separate research facility
nor a separate research staff. The College of Engineering requires that
any research it undertakes have academic significance. A large part of
the college’s research program deals with developing new knowledge that
is applicable to Idaho’s economy or devising new methods or applications
for using existing knowledge to the benefit of the state of Idaho. Most of
the funds in support of research come from sources other than legislative
appropriations. These funds are the result of research contracts and
grants with various local, state, and federal agencies and private industry.
Information regarding research capabilities is available upon request.

Believing that education is a never-ending need of mankind, the College
of Engineering, through the means of short courses, workshops, seminars
and forums, and pertinent publications, attempts to ascertain and meet
the specific continuing education needs of Idaho’s graduate engineers,
computer scientists, and the technical community. Staff members also
endeavor to provide information to the entire population of Idaho that
may contribute to the successful solving of societal problems.

Off-Campus Programs
To fulfill its charge to provide engineering education to the people of
Idaho, the College of Engineering provides several degree programs off
campus. Graduate degrees in most disciplines are available through
the Resident Instructional Centers at Boise, Idaho Falls, and Coeur
d’Alene, using a combination of resident faculty, real-time video, and
web-supported DVD courses. The Engineering Outreach program uses a
variety of technologies to provide graduate and advanced undergraduate
course work, including some complete master’s degrees, at any location.
For more information, see “Resident Instructional Centers.”

General College Requirements for
Graduation

University Requirements. See regulation J (https://catalog.uidaho.edu/
general-requirements-academic-procedures/j-general-requirements-
-baccalaureate-degrees) for requirements that all students in the
university must meet.

College Requirements. The minimum credit requirement for university
curricula is 120 credits for an undergraduate degree. Some engineering
curricula require a greater number of credits.
Note: In calculating the credit total for each degree, the College of Engineering does not include credits that a student may have been required to earn in ENGL 101, MATH 143, and any courses taken to remove deficiencies.

Courses of Study and Degrees

The College of Engineering includes the degree-granting Departments of Biological Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Mechanical Engineering, and the Department of Computer Science. Careful attention is given to curriculum content and educational philosophy to keep all programs attuned to rapidly changing technology.

Programs in the college lead to the Bachelor of Science in the following disciplines: Biological Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Material Science and Engineering, Mechanical Engineering, Computer Science, and Industrial Technology.

Most of the courses taken by freshmen and sophomores are the same in all curricula. The student may postpone a final decision on a branch of study for a year or more with little, if any, consequence, thus allowing ample opportunity for professional orientation. The junior and senior years are devoted to application of basic principles and design in the various fields of practice.

Courses of study leading to the degrees of Master of Science (M.S.), Master of Engineering (M.Engr.), and Doctor of Philosophy (Ph.D.) are offered in biological, chemical, civil, electrical, geological, and mechanical engineering. The M.S. and M.Engr. degrees are available in computer engineering and environmental engineering, and the M.S. and Ph.D. degrees are available in computer science. Master of Science degrees are available in geological engineering, material science and engineering, and technology management. The PhD degree is also available in Material Science and Engineering. The Master of Engineering in engineering management is also available. The M.S., M.Engr., and Ph.D. degrees in nuclear engineering are available at the Idaho Falls Center.

Major Curricula

The curriculum for each major is listed in the individual department section. Each curriculum provides for electives to be arranged in consultation with the student’s advisor in accordance with the student’s interest and consistent with current department and college policies. The electives are intended to provide flexibility in the student’s program. Undesignated electives will usually be taken outside of the student’s major field of study.

The following undergraduate programs in the College of Engineering are currently accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone: (410) 347-7700: Biological Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Material Science and Engineering, and Mechanical Engineering. The computer science program is accredited by the Computing Accreditation Commission of ABET. Minors are offered in several programs but we do not pursue accreditation of minors.