ENGINEERING & APPLIED SCIENCE

The College of Engineering and Applied Science has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery, innovation, community and culture. Our college is the top-ranked engineering school in the Rocky Mountain region.

Mission & Vision

The College of Engineering & Applied Science's mission is to generate new knowledge in engineering and related fields, and to equip students from diverse backgrounds to become leaders and citizens responsible for the betterment of individuals and society. Our vision is to be a recognized world leader for excellence and innovation in engineering research and education, with an emphasis on inclusive excellence, active learning and global society.

Degrees

The College of Engineering and Applied Science offers Bachelor of Science degrees in:

- Aerospace engineering sciences (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/aerospace-engineering-sciences/aerospace-engineering-science-bachelor-science-bsae/)
- Applied mathematics (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/applied-mathematics/applied-mathematics-bachelor-science-bsam/)
- Architectural engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/civil-environmental-architectural-engineering/architectural-engineering-bachelor-science-bsare/)
- Biological engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/chemical-biological-engineering/chemical-biological-engineering-bachelor-science-bscb/)
- Biomedical engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/biomedical-engineering/biomedical-engineering-bachelor-science-bsbm/)
- Chemical engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/chemical-biological-engineering/chemical-engineering-bachelor-science-bs/)
- Civil engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/civil-environmental-architectural-engineering/civil-engineering-bachelor-science-bs/)
- Computer science (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-bachelor-science-bs/)
- Creative technology and design (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/creative-technology-design/creative-technology-design-bachelor-science-bsctd/)
- Electrical engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/electrical-computer-energy-engineering/electrical-engineering-bachelor-science-bs/)
- Electrical and computer engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/electrical-computer-energy-engineering/electrical-computer-engineering-bachelor-science-bs/)
- Engineering physics (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/engineering-physics/engineering-physics-bachelor-science-bs/)
- Environmental engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/civil-environmental-architectural-engineering/environmental-engineering-bachelor-science-bs/)
- Integrated design engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/engineering-plus/engineering-plus-bachelor-science-bs/)
- Mechanical engineering (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/mechanical-engineering/mechanical-engineering-bachelor-science-bs/)

Along with a Bachelor of Arts degree in Computer Science (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-bachelor-arts-ba/) and a post-baccalaureate Bachelor of Science degree in Applied Computer Science (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/applied-computer-science-post-baccalaureate-bachelor-science-bsacs/).

Accreditation

The CU Boulder campus is accredited by the Higher Learning Commission. Programs accredited by ABET (https://www.abet.org/) can be found on the College of Engineering & Applied Science Accreditation (https://www.colorado.edu/engineering/accreditation/) webpage. The degrees in applied mathematics and engineering physics are offered in cooperation with the Department of Applied Mathematics and Department of Physics in the College of Arts and Sciences.

Professional Registration

Professional registration is recommended for all fields of engineering in order to protect the health, safety and welfare of the public. Registration is required in all states for the legal right to practice professional engineering. Although there are variations in state laws regarding engineering licensure, there is a general four-step process for licensure candidates: earn a degree from an EAC/ABET-accredited engineering program, pass the FE exam, gain acceptable work experience under the supervision of a PE and pass the PE exam. Students typically take the FE exam during their senior year in college.

Areas of Interest

BOLD Center

The BOLD Center (https://www.colorado.edu/engineering/bold/) is part of the College of Engineering and Applied Science's commitment to creating a diverse environment where all engineering students are welcome and

where students who are traditionally underrepresented in engineering—women, underrepresented minorities—are empowered to achieve their dreams. BOLD Center programs promote the recruitment, retention and development of engineering students at CU Boulder and equip them for success through graduation and beyond.

Colorado Space Grant Consortium

CU's Space Grant program provides interdisciplinary students with access to space through innovative courses and real-world, hands-on space hardware programs that include short and long-duration, high altitude balloon payloads, sounding rocket payloads and low-Earth orbiting satellite missions. NASA's Colorado Space Grant Consortium (http://spacegrant.colorado.edu) (also known as Space Grant) is part of a national program.

Space Grant students interact with engineers and scientists from NASA and industry to develop, test and fly new space technologies. All missions are entirely student run—including students in the roles of team members, team leads, systems engineers, project managers and mission operators. Students participate in programs that aid them in their future academic courses and careers.

Engineering Connections

Engineering Connections is the residential community for first-year engineering students (https://www.colorado.edu/engineering/engineering-residential-community/), which has staff and faculty dedicated to developing curricular, co-curricular, social and wellness programs just for them. These programs are specifically designed to help engineering and applied science students build the sense of community and belonging they need to succeed—from their first day through graduation day.

Engineering Honors Program

Incoming first-year students are selected to participate in the Engineering Honors Program via an online application process. The Engineering Honors Program (http://www.cuhonorsengineering.com/) (EHP) provides an educational experience that transcends the classroom and matches the unique abilities, needs and ambitions of this select group of students. The program is for students who want to help build an honors culture that cares more about learning than grades; more about maximizing opportunities than meeting minimum requirements; and more about being thoughtful, critical, engaged and intentional than being passively defined by the vague expectations of others. Being part of EHP means belonging to a community that is ambitious without being competitive and committed to a wide range of goals from international development work to graduate school, from research to teaching, and from industry to service. It means living next to students already doing research, returning from summer internships, working with Engineers without Borders and applying to graduate school.

Engineering Leadership Program

The Engineering Leadership Program (https://www.colorado.edu/engineeringleadershipprogram/) (ENLP) explores leadership challenges in applied science using liberal arts pedagogy. The program aims to cultivate leaders of curiosity and character, whose technical expertise is enriched through the study of the political, moral, and philosophic dilemmas posed by the perpetual advancement of science and technology. The program offers a wide variety of courses on the thought and practice of leadership, many of which utilize primary source texts in history, the philosophy of science, moral philosophy, political science and anthropology. The program's courses (with ENLP course prefix) count for humanities and social sciences credit in the College of Engineering and Applied Science, and most courses are discussion-based seminars. Students with a deep interest in ENLP's curriculum are encouraged to pursue the Engineering Leadership Certificate (https://www.colorado.edu/engineeringleadershipprogram/course-offerings-and-certificate-requirements/). The program also addresses contemporary concerns in engineering practice. CU engineering alumni and established leaders from engineering industry, business and politics frequently visit ENLP classes to give guest lectures, hold interview sessions, and converse with students over informal lunches. The Engineering Leadership Program has also partnered with the Engineering Management Program to offer coursework for ENLP students interested in engineering project management, engineering entrepreneurship and engineering economics.

Global Engineering

In today's global environment, engineers can expect to work in multilingual and multicultural teams and to engage in projects with global impact. It is therefore essential that students develop global engineering competencies alongside their technical skills, and engineering students have numerous pathways to build those competencies. The Global Engineering Residential Academic Program (https://www.colorado.edu/center/mortenson/residential-academic-program/program/) prepares students for the global marketplace of ideas. The program not only supports students in understanding the global context and their role as engineers through coursework, but also provides a community through which to explore, discuss and apply the concepts of global engineering in their personal and professional lives. Students have direct interaction with faculty, staff, graduate and undergraduate students who are engaging in global engineering research, policy and practice. The program also builds connections with international experts outside of CU Boulder, drawing on the experience of alumni, international research partners, and organizations based in the Greater Denver area.

Additional opportunities include engineering study abroad and completing a Global Engineering Minor. For more information, visit the college's International Programs (http://www.colorado.edu/engineering-international/) website.

Herbst Program for Engineering, Ethics & Society

The Herbst Program for Engineering, Ethics & Society (http://www.colorado.edu/herbst/) enriches and broadens the education of engineering students with seminar and lecture courses in literature, philosophy, history, social issues and the arts.

In its two seminars, ENES 1010 and ENES 3100, class time is devoted almost exclusively to roundtable discussion of original texts in literature, philosophy and the fine arts. These seminars have fewer than 14 students, so students can hone their critical thinking skills through reading, discussion and extensive writing. Both of these seminars satisfy the college's writing requirement. Note: ENES 1010 satisfies the writing requirement only when taken in a student's freshman year.

The Herbst Program offers various lecture courses on a rotating basis. Engineering in History: The Social Impact of Technology (ENES 1850) studies technological change and its consequences through time. ENES 2100, ENES 2120 and ENES 2130 together survey science and technology from the Stone Age to the 20th century. Modern Science and Technological Society (ENES 2210) explores the ethics and social implications of engineering practice. Special topics courses are occasionally offered (ENES 2843 or ENES 3843); these address subjects as varied as world folklore, the ethics of bioengineering and

the relationship between science and religion. The Herbst Program also offers summer and study abroad courses.

Clancy and Linda Herbst founded and endowed the program in 1989 and continue to sustain it. It is also supported by the Price Foundation, the Engineering Excellence Fund, CEAS and many friends and alumni.

Idea Forge

The Idea Forge (http://www.colorado.edu/ideaforge/) is a flexible, cross-disciplinary collaborative space where students can imagine, design, create and test products and solutions to meet a range of societal and customer needs. The space serves as the home for Design Center Colorado and Catalyze CU. It supports student teams working on invention and innovation as part of courses, as well as design and development driven by entrepreneurial-minded individuals and service-oriented groups. With all these students working side-by-side, the Idea Forge boosts student learning through collaborative, hands-on experience, while supporting industry interaction through scheduled workshops as well as spontaneous exchanges.

The mission of the Idea Forge is to enhance interdisciplinary creativity and synergy to develop flexible, adaptable and practical graduates. To do this, the Idea Forge supports design from a variety of perspectives, from the most formal engineering design process to the human-centered design philosophy. By providing students the opportunity to design, build and test their concepts, the Idea Forge builds creative confidence and promotes the formation of strong professional skills.

The Idea Forge boasts a variety of flexible spaces to achieve its mission and to fit individual student needs. These spaces fit into three categories: fabrication shops, project space and community space. The fabrication shops provide students with the tools and equipment needed for prototyping through machining, welding, 3D printing, laser cutting, woodworking and sewing with an additional emphasis on electronics and micro-controllers. Students learn safe, efficient use of the tools and equipment through action, by taking workshops or tackling a project. Project spaces fill the Idea Forge – students are able to find their nearest wood-topped workbench to assemble their design. The central Idea Forge Commons, an inspiring environment for teamwork and brainstorming, doubles as a project space and a community space. Just off the Commons, the Thinking Lounge community space provides students with a comfortable place to take a break. Additional community space consists of two impressive conference rooms, which are perfect for meetings with industry and community members.

Integrated Teaching and Learning Program

The Integrated Teaching and Learning (ITL) program (http://itll.colorado.edu) provides K–16 engineering education initiatives aimed at supporting the teaching and learning of hands-on, minds-on engineering curriculum so that students of all ages can imagine a future in engineering. With a focus on engineering design, undergraduate engineering students have the ability to create what they dream via modern manufacturing and electronics capabilities—reinforced through innovative engineering courses, as well as through time set aside for the creation of personal projects to expand one's creative thinking.

Through ITL Program skill-building workshops on tools, machining, soldering, circuits, strain gauges, laser cutters, Arduino microcontrollers, LabVIEW, SolidWorks, spatial visualization and more, students become comfortable with the resources that help them do the engineering that impacts everyday life. The multidisciplinary, hands-on ITL Laboratory features two open and interactive laboratory plazas that support inquiry-based experimentation, data acquisition and analysis capability. The laboratory also hosts design studios, team work areas, active learning spaces—all designed to be used by all disciplines of CU engineering students as they do engineering.

The ITL Program's nationally recognized K–12 engineering education program focuses on attracting and preparing more diverse and well-prepared youth to careers in engineering and technology. K–12 audiences may visit the ITL Laboratory to learn how engineering is an essential part of their lives through myriad hands-on science and engineering exhibits. K–12 teachers and students can also access the TeachEngineering digital library, a free online curricular resource supporting educators to bring engineering into their K–12 classrooms through high quality engineering lessons and hands-on activities aligned to science, mathematics and technological educational standards. Accessed by over 1.6 million unique users in the past year, TeachEngineering has become a key resource to the broad national STEM movement and the growing K–12 engineering community.

The ITL program features an innovative interdisciplinary undergraduate curriculum that includes the retention-building First-Year Engineering Projects course that engages student teams to experience the design process in a hands-on way, culminating in an end-of-semester public design expo. The ITL Program also supports the design courses that distinguish the Engineering Plus degree program.

ProReady

The ProReady (https://www.colorado.edu/engineering/proready/) initiative is designed to prepare College of Engineering & Applied Science students for professional readiness and career success in their chosen field. The ProReady formula helps students: chart their career path, gain relevant experience and grow their professional network. Career exploration and preparation, internships, undergraduate research, study abroad, student organization leadership, graduate school preparation and more are all part of being ProReady!