A degree in electrical engineering provides graduates the opportunity to enter the profession of engineering and to engage in work as a design, production, testing, consulting, research, teaching or management professional in a wide variety of careers in the computer industry, embedded systems, telecommunications, instruments, the power and renewable energy industry, the biomedical industry, aerospace and academia. Some graduates also go on to develop careers in other professions like law and medicine.

Examples of career opportunities include development of new electrical or electronic devices, instruments or products; design of equipment or systems; production and quality control of electrical products for private industry or government; sales or management for a private firm or government; and teaching and research in a university.

**Requirements**

Required courses in engineering, physical science, and mathematics are interwoven throughout the curriculum to provide a balanced education in the fundamentals of the electrical engineering profession. The core courses are complemented by technical electives, humanities and social sciences electives (http://www.colorado.edu/engineering/academics/policies/hss), free electives, and a writing course (http://www.colorado.edu/engineering/academics/policies/hss), for a total of 128 credits required for the degree.

**Prerequisites and Passing Grades**

The Electrical, Computer and Energy Engineering Department reserves the right to drop students enrolled in ECEN courses who have not met the minimum prerequisite requirements. It is the student’s responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

The minimum passing grade for a course that is a prerequisite or corequisite for another required course is C-. If a grade of D+ or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C- or higher. If a grade of D+ or lower is received in a course which is a corequisite to another, the course must be repeated until a grade of C or higher is achieved.

The minimum passing grade for a course that is not specifically a prerequisite or corequisite for another required course is D-.

**Sample Four-Year Plan of Study: Electrical Engineering**

The following information represents a sample 8-semester sequence of study only. Up-to-date curricular information and policies are contained in the ECEE HELP Guide.
Year Four

Fall Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECEN 4610 Capstone Laboratory Part 1</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Concentration Elective #1</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Concentration Elective #2</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Social Science Elective (Upper Division)</td>
<td>3</td>
</tr>
<tr>
<td>Free Elective</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

Spring Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECEN 4620 Capstone Lab, Part 2</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Concentration Elective #3</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Concentration Elective #4</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Social Sciences Elective (Upper Division)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

| **Total Credit Hours**                      | **128**      |

1 Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (http://www.colorado.edu/engineering/academics/policies/hss).
2 Students may choose a course from the list of college-approved writing courses (http://www.colorado.edu/engineering/academics/policies/hss).
3 See ECEE Help Guide (https://www.colorado.edu/ecee/undergraduate-program/student-resources) for more information.

Learning Outcomes

During the first several years after completion of their baccalaureate studies:

- Graduates will be situated in growing careers involving the design, development or support of electrical or electronic systems, devices, instruments, or products, or will be successfully pursuing an advanced degree.
- Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.
- Graduates will have demonstrated professional and personal leadership and growth.

The electrical engineering curriculum is designed to prepare graduates to meet these objectives as follows:

- Graduates will be situated in growing careers involving the design, development or support of electrical or electronic systems, devices, instruments, or products, or will be successfully pursuing an advanced degree.
- Graduates attaining the electrical engineering degree will have comprehensive knowledge and experience in the concepts and design of electrical and electronic devices, circuits and systems. This is achieved through a sequence of required courses in these areas, culminating in a major design project incorporating realistic engineering constraints. Moreover, graduates will have advanced, specialized knowledge and skills in elective areas such as communications and digital signal processing, control systems, analog and digital integrated circuit design, semiconductor devices and optoelectronics, electromagnetics and wireless systems, power electronics and renewable energy, bioelectronics and digital systems.
- Electrical engineering graduates will have attained other professional skills that will be useful throughout their careers, including verbal and written communication and the ability to function on multi-disciplinary teams.
- The electrical engineering curriculum is rich in laboratory work. Graduates will have achieved extensive practical experience in the laboratory techniques, tools and skills that provide a bridge between theory and practice.
- Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.
- Electrical engineering graduates experience a curriculum that contains a broad core of classes focused on mathematical and physical principles that are fundamental to the field of electrical engineering. Hence, they understand the physical and mathematical principles underlying electrical and electronic technology, and are able to analyze and solve electrical engineering problems using this knowledge. In addition to basic classes in mathematics, science and computing, the electrical engineering curriculum includes a sequence of courses in analog and digital electronic circuits and systems and electromagnetic fields.
- Graduates will have demonstrated professional and personal leadership and growth.
- To lay the foundation for a long career in a rapidly changing field, a broad background of fundamental knowledge is required. This is achieved in the electrical engineering curriculum through a sequence of required classes in mathematics, physics, chemistry and the electrical engineering core. In addition, the graduate must be capable of lifelong learning; this is taught through assignments and projects that require independent research and study.
- The curriculum includes a significant component of electives in the humanities and social sciences. EE graduates will have knowledge of the broader contemporary issues that impact engineering solutions in a global and societal context. They will have the verbal and written communications skills necessary for a successful career in industry or academia. Graduates also understand the meaning and importance of professional and ethical responsibility.

Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
• Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.
• Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Bachelor's–Accelerated Master's Degree Program(s)**

The Bachelor’s–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor’s and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor’s and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor’s–accelerated master’s program enables students to continue working with their established faculty mentors.

**Admissions Requirements**

**BS and MS in Electrical Engineering**

In order to gain admission to the BAM program named above, a student must meet the following criteria:

• Have a cumulative GPA of 3.25 or higher and a minimum GPA of 3.25 in ECEN courses
• Have completed 9–10 core ECEN courses (for more information, see the BAM degree [website](https://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees))
• Have at least junior class standing
• Transfer students must have completed a minimum of 24 credit hours at CU Boulder

**BS in Electrical Engineering, MS in Interdisciplinary Telecommunications**

In order to gain admission to the BAM program named above, a student must meet the following criteria:

• Have a cumulative GPA of 3.25 or higher
• Have a major GPA of 3.25 or higher
• Have at least junior class standing

**Program Requirements (for both programs above)**

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master’s degree. However, only six credits of coursework may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor’s degree, and apply to continue with the master’s degree, early in the semester in which the undergraduate requirements will be completed.1

1 Students who were admitted prior to July 2019 follow a concurrent Bachelor’s/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

Please see the Electrical Engineering/Electrical Engineering BAM degree program ([website](https://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees)) or Electrical Engineering/Telecommunications BAM degree program ([website](https://www.colorado.edu/itp/current-students/undergraduate/bsms-degree)) web pages for more information.