

# ELECTRICAL & COMPUTER ENGINEERING - MASTER OF SCIENCE (MS)

The Department of Electrical, Computer & Energy Engineering (ECEE) offers degree options tailored to both working engineers looking to advance their careers and to those looking to pursue a career in academia. Research and coursework is concentrated in six broad areas:

- Photonics and quantum engineering
- Learning, information, network, communication and data sciences
- Computer engineering
- Systems and controls
- Electromagnetics, RF and microwaves
- Power electronics

For more information, visit the department's MS degree (<https://www.colorado.edu/ecee/academics/graduate-programs/master-science-electrical-engineering/degree-requirements/>) webpage or the application requirements (<https://www.colorado.edu/ecee/admissions/graduate-admissions/>) webpage.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the bachelor's–accelerated master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab (<https://www.colorado.edu/ecee/undergraduate-program/degrees/bachelors-accelerated-masters-degree/>) for the associated bachelor's degree(s):

- Electrical and Computer Engineering - Bachelor of Science (BS) (<https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/electrical-computer-energy-engineering/electrical-computer-engineering-bachelor-science-bs/#acceleratedmasterstext>)
- Electrical Engineering - Bachelor of Science (BS) (<https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/electrical-computer-energy-engineering/electrical-engineering-bachelor-science-bs/#acceleratedmasterstext>)

## Requirements

The department offers two traditional MS degree plans. Both require a total of 30 credit hours of coursework.

- Plan I: Thesis
- Plan II: Coursework Only

A thesis is optional for students in this program; all students are admitted on the non-thesis, coursework-only track; the declaration of a thesis comes after the first year in the program.

There are no subplans to the traditional MS degree. Our traditional MS degree includes six focus areas which students can specify an interest in in their application, but, if admitted, students are able to

take classes among all these areas (subject to enrollment restrictions/priorities) to best learn the varied knowledge they want for their future career path.

## Plan I Degree Requirements

### Coursework Requirements

- 18 credit hours of ECEN 5000-level or above courses are required, including 4-6 credit hours of Master's Thesis.
  - The total number of combined hours of independent study and thesis research shall not exceed 9 hours.
  - 3 credits total of ECEN 5930, Professional Internship Course, can be used toward the 30-credit hour requirement.
- The remaining 12 credit hours can be ECEN courses or technical courses in science, mathematics, or engineering. Generally these should be at the 5000-level or above.
  - A maximum of 6 of these credit hours may be at the 4000-level unless the course is ECEN, a nontechnical course, or a course cross-listed with an ECEN course.
- Additionally, these 12 credits can include:
  - A single non-technical course such as EMEN or CYBR (check with your advisor to verify a course is non-technical).
  - A maximum of two technical CYBR courses are permitted.
  - You must petition your academic advisor if you wish to take any courses from departments outside of the College of Engineering and Applied Science.

## Plan II Degree Requirements

### Course Requirements

- 18 credit hours of ECEN 5000-level or above courses are required.
  - The total number of combined hours of independent study shall not exceed 6 hours.
  - 3 credits total of ECEN 5930, Professional Internship Course, can be used toward the 30-credit hour requirement.
- The remaining 12 credit hours can be ECEN courses or technical courses in science, mathematics, or engineering. Generally these should be at the 5000-level or above.
  - A maximum of 6 of these credit hours may be at the 4000-level unless the course is ECEN, a nontechnical course, or a course cross-listed with an ECEN course.
- Additionally, these 12 credits can include:
  - A single non-technical course such as EMEN or CYBR (check with your advisor to verify a course is non-technical).
  - A maximum of two technical CYBR courses are permitted.
  - You must petition your academic advisor if you wish to take any courses from departments outside of the College of Engineering and Applied Science.

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework. Most students complete the degree in two years.

## Learning Outcomes

By the completion of the program, students will:

- Gain the necessary understanding to interpret and explain results published within their field of study and enable them to address modern engineering challenges (thesis or non-thesis).
- Learn the necessary communication skills to help them gain meaningful employment within their chosen field of study (thesis or non-thesis).
- Acquire the experimental and/or analytical skills essential to a career in their chosen field of study (thesis or non-thesis).
- Learn to conduct scientific research effectively (thesis only).
- Learn communication skills essential to the dissemination of their technical findings (thesis only).