# ELECTRICAL AND COMPUTER ENGINEERING MINOR

Department: Electrical and Computer Engineering (https://catalog.bradley.edu/undergraduate/engineering-technology/electrical-computer-engineering/)

## Department Mission and Educational Objectives

**Department Mission**: the mission of the Electrical and Computer Engineering Department is to educate the next generation of electrical and computer engineers to meet the challenges of the future, and empower electrical engineering graduates for immediate and sustained success in their professional practice.

**Program Educational Objectives**: The ECE faculty recognize that there are a number of common elements inherent to the success in the profession, which include the following: ability to acquire, generate, and use new knowledge; ability to complete complex electrical engineering projects; critical thinking, experience, knowledge, skills, and capabilities relevant to profession. These elements required for success in the profession translate into these educational objectives of the program. It is the expectation of the ECE faculty that graduates of the EE program will attain the following goals within a few years of graduation,

1. Are applying their education to their professional work in the public or private sectors or obtaining an advanced degree in electrical engineering or related areas;
2. Are engaging in lifelong learning using their education as a foundation.
3. Are productive while demonstrating professional growth and assuming positions of increasing responsibility.

## Student Outcomes

In order to meet these program educational objectives, students graduating from Bradley's electrical engineering program will attain the following outcomes.

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to 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
3. an ability to communicate effectively with a range of audiences
4. an ability to 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
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

The goal of the ECE department is to provide the intellectual and physical learning environment in which students achieve these outcomes. The intellectual component of this environment is supplied by the ECE faculty members, in their roles as mentors, advisors, and engineering professionals, as well as by the curriculum they establish for the programs. The physical component consists of quality facilities equipped with state-of-art instrumentation, equipment, computers, and professional software.

A Minor in Electrical and Computer Engineering from that department encourages students from any major to learn electronics and electrical and computer engineering. In the industrial world, ECE has been playing a pivotal role and collaborating with others such as business, mechanical engineering, biomedical engineering, industrial engineering and so on. The minor program will allow non-majors to enhance their skillsets and to cross disciplinary boundaries. Courses will simulate a multidisciplinary learning/working environment for all students within the curriculum.

## Entry Requirements:

1. To be declared in a major other than Electrical and Computer Engineering Programs
2. To have finished at least one full semester at Bradley University
3. An overall GPA of 2.25 or better
4. To have credit (either by transfer or letter grade) for at least one class in each of the following categories
   a. Calculus
   b. Calculus-based physics courses or chemistry courses
   c. Engineering Introduction courses
5. To be proficient in computer programming using a strongly typed programming language, for example, C, C++, or Java.

For more information about the structure of this minor program, please consult with the ECE minor advisor for qualification and requirements.

Required Courses- 19 hours

| Code | Title | Hours |
|---|---|---|
| ECE 214 | Linear Circuits Analysis and Design | 4.0 |
| or ECE 227 | Electrical Engineering Fundamentals | |
| ECE 305 | Microcontroller Architecture, Programming and Applications | 4.0 |
| ECE 398 | Vertical Integrated Project (repeatable project-based course) | 2 |
| Three ECE-prefix courses (at least one of them is ECE 400 or above) | | 9.0 |
| **Total Hours** | | **19** |