

# ELECTRICAL AND COMPUTER ENGINEERING: BIOMEDICAL ENGINEERING (M.S.)

<https://ceps.unh.edu/electrical-computer-engineering/program/ms/electrical-computer-engineering-biomedical-engineering>

## Description

Our graduate programs are flexible allowing the student a wide choice of courses as well as research topics. We will prepare students for professional skills such as working collaboratively, scholarly writing, and technical presentation and publications. Our programs will provide the students the training needed to pursue a career both in industry and academia.

The programs will increase the breadth and depth of the students' electrical and computer engineering knowledge and help them develop the specialized skills in areas including but not limited to biomedical engineering, human-computer interaction, wireless communication, integrated circuit design, cybersecurity, control system and robotics, sensor design, wearable electronics, image processing, Internet-of-Things, computer architecture, and medical instrumentation.

Students have internship opportunities such as UNH Interoperability Laboratory (IOL), Center of Coastal Mapping (CCOM), Institute for the study of Earth, Ocean, and Space (EOS), etc.

## Requirements

### Degree Requirements

The M.S. ECE Biomedical Engineering option is intended for students with interests in medical image processing, biomedical instrumentation, and biosensors.

Master of science in electrical and computer engineering (M.S. ECE) with an option in biomedical engineering degree students must take a minimum of 31 graduate credits.

Code	Title	Credits
<i>Required Courses</i>		
ECE 817	Introduction to Digital Image Processing	4
ECE 884	Biomedical Instrumentation	4
ECE 925	Biosensors: Fundamentals and Applications	3
ECE 910	Graduate Seminar	1
ECE 992	Advanced Topics in Electrical Engineering	4
ECE 899	Master's Thesis	6
<i>Elective Courses</i>		
9 credits of graduate coursework, with at least 6 credit hours earned in 900-level courses		
<b>Total Credits</b>		<b>31</b>

Up to 12 credits earned in non-ECE courses numbered 800-899 may be taken for graduate credit by ECE M.S. degree students provided the courses are petitioned and approved by the ECE Graduate Committee.

A student may petition that a maximum of 12 UNH graduate credits or a maximum of 8 non-UNH graduate credits taken prior to admission into

the ECE Master of Science degree program be applied to fulfill the degree requirements.

Once the student has been admitted into the program, under certain circumstances it may be desirable to take courses outside the ECE department to attain the goals outlined in the student's program of study. In these cases, up to two non-ECE 900-level courses are allowed without petition, but students need to have their thesis advisor's approval. Students need to take at least two 900-level courses (neither of which may be independent studies) within the department. Students must petition to the ECE Graduate Committee before course registration. To take more than 2 non ECE courses (either 800 or 900 level) students must submit a petition to the ECE Graduate Committee.

## Student Learning Outcomes

- Students will master the theoretical concepts or/and practical implementation in advanced aspects of biomedical engineering, human-computer interaction, wireless communication, integrated circuit design, cybersecurity, control system and robotics, sensor design, wearable electronics, image processing, Internet-of-Things, computer architecture, and medical instrumentation.
- Students will be proficient in collecting and analyzing data using contemporary laboratory equipment.
- As a result of our two-semester ECE900 courses, students will develop and demonstrate proficiency in the use of library searches along with interpreting and presenting technical information found in those searches.
- Students will have the professional skills such as working collaboratively, scholarly writing, and technical publications.
- Students will be well trained to pursue a career both in industry and academia.