

ELECTRICAL AND COMPUTER ENGINEERING (B.S.)

In addition to the Undergraduate Program Goals for the College of Engineering, the specific objectives of the Bachelor of Science program in Electrical Engineering include the following:

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.

Admission Requirements

For admission to the Bachelor of Science program, students must satisfy the admission criteria of the Division of Engineering, College of Engineering (<http://bulletins.wayne.edu/undergraduate/college-engineering/bs/>).

Program Requirements

Candidates for the Bachelor of Science degree must complete **127-130 credits of coursework**, including the University General Education (<http://bulletins.wayne.edu/undergraduate/general-information/general-education/>) requirements. All course work must be completed in accordance with the academic procedures of the University (<http://bulletins.wayne.edu/undergraduate/general-information/>) and the College of Engineering (<http://bulletins.wayne.edu/undergraduate/college-engineering/academic-regulations/>) governing undergraduate scholarship and degrees. The degree requirements shown in the curriculum below are in effect as of the publication date of this bulletin. However, students should consult an academic advisor for verification of current requirements.

In the freshman and sophomore years, the student acquires a foundation in the principles of science and mathematics required for the study of engineering. In addition, general education studies are provided to ensure a well-rounded education. Basic concepts of electrical circuits, electronics, computers and electromagnetic fields are studied after prerequisite mathematics and science backgrounds are mastered. In the senior year, a choice of electrical and computer engineering electives permits the student to specialize in one or more areas.

Electrical and Computer Engineering Curriculum

First Year		
First Semester		
BE 1200	Basic Engineering I: Design in Engineering	3
CHM 1125	General Chemistry I for Engineers	3
CHM 1130	General Chemistry I Laboratory	1
ENG 1020	Introductory College Writing	3
MAT 2010	Calculus I	4
Credits		14
Second Semester		
BE 1500	Introduction to Programming and Computation for Engineers	3
ECE 2050	Object-Oriented Programming for Electrical and Computer Engineering	3
MAT 2020	Calculus II	4
PHY 2170	University Physics I for Scientists and Engineers *	4
Any (CIV) Course		3
Credits		17
Second Year		
First Semester		
BE 2100	Basic Engineering III: Probability and Statistics in Engineering	3
ECE 2610	Digital Logic Design	4
MAT 2030	Calculus III	4
PHY 2180	University Physics II for Scientists and Engineers *	4
PHY 2181	University Physics II Experimental Laboratory *	1
Credits		16
Second Semester		
ECE 3040	Numerical Methods for Engineers	3
ECE 3300	Introduction to Electrical Circuits	4
MAT 2150	Differential Equations and Matrix Algebra	4
MAT 2860	Discrete Mathematics	3
Any (DEI) Course		3
Credits		17
Third Year		
First Semester		
ECE 3330	Electrical Circuits II	3
ECE 3570	Electronics	4
ECE 3620	Introduction to Microcomputers	4
ECE 4050	Algorithms and Data Structures	3
ENG 3050	Technical Communication I: Reports	3
Credits		17
Second Semester		
ECE 4330	Linear Systems and Signals	4
ECE 4570	Fundamentals of Microelectronic Devices	3
ECE 4680	Computer Architecture	3
ENG 3060	Technical Communication II: Presentations	3
Any (GL) Course - Global Learning		3
Credits		16
Fourth Year		
First Semester		
ECE 4470	Control Systems I	3
ECE 4700	Introduction to Communication Theory	4
PHI 1120 or PHI 2320	Professional Ethics or Introduction to Ethics	3
ECE 4800	Electromagnetic Fields and Waves I	3
ECE Elective		3-4
Credits		16-17
Second Semester		
ECE 4600	Capstone Design I	4
ECO 2010 or ECO 2020 or ECO 1000	Principles of Microeconomics or Principles of Macroeconomics or Survey of Economics	4

2 ECE Electives	6-8
Credits	14-16
Total Credits	127-130

* Students are required to take either PHY 2170 along with PHY 2171 **OR** or take PHY 2181 along with PHY 2180. The Electrical Engineering department recommends taking PHY 2181.

Substitution of a course not on this list requires approval of the department chairperson or delegated faculty advisor.

Course Material Fee

A course material fee is charged for laboratory courses using expendable materials.

Electrical and Computer Engineering (ECE) Honors requirements:

EE department requirements (24 credits total):

- Need a minimum GPA of 3.5 and 3.3 Honors GPA
- 11 credits must be in Engineering Honors courses including the following:
 - BE 5998 Engineering Honors Thesis (4 cr.)
 - ECE 3040 Numerical Methods for Engineers (Honors Option) (3 cr.)
 - ECE 4000 level course with an Honors Option (4 cr.)
 - A junior/senior seminar

The additional 10 credits required for graduation with Honors may be taken in any department, including additional Engineering courses.

Suggestions include: approved AGRADE courses, BIO 1510, ECO 2010 or ECO 2020, MAT 2010 (Emerging Scholars Section), MAT 2020 (Emerging Scholars Section), BE 2100 (Honors Section)