

ELECTRICAL 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. Graduates will understand relevant engineering and scientific principles underlying electrical and computer technologies, and have the capability to apply theoretical, computational, and experimental methods to solve real engineering problems.
2. Graduates will have strong oral and written communication skills to interact with fellow engineers and non-technical personnel in a team environment.
3. Graduates will have computer skills for effective use in engineering. They will possess a working knowledge of modern programming languages, as well as operating systems and software packages for design, analysis, and simulation.
4. Graduates will be able to work hands-on in laboratories with state-of-the-art facilities and equipment to accomplish assigned tasks and projects.
5. Graduates will be aware of the societal responsibility of engineers and the essential nature of high ethical standards of professional behavior.
6. Graduates will possess effective engineering design capability and an awareness of cost, safety, sustainability, accessibility, and other associated constraints in engineering design.

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/>).

Candidates for the Bachelor of Science degree must complete **126 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 Engineering Curriculum

First Year		Credits
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
Any (WE) Wayne Experience		1

Credits 15

Second Semester		
BE 1500	Introduction to Programmin and Computator for Engineers	3
CSC 2000	Introduction to C++ Programming Language	3
MAT 2020	Calculus II	4
PHY 2175	University Physics for Engineers I	4

Credits 14

Second Year		
First Semester		
ECE 2610	Digital Logic Design	4
MAT 2030	Calculus III	4
PHY 2185	University Physics for Engineers II	4
PHY 2181	University Physics Laboratory II * See Note at Bottom of Curriculum	1
Any (CIV) Civic Literacy		3

Credits 16

Second Semester		
BE 2100	Basic Engineering III: Probability and Statistics in Engineering	3
ECE 3300	Introduction to Electrical Circuits	4
ECE 3620	Introduction to Microcomputers	4
MAT 2150	Differential Equations and Matrix Algebra	4

Credits 15

Third Year		
First Semester		
ECE 3040	Numerical Methods for Engineers	3

ECE 3330	Electrical Circuits II	3
ECE 3570	Electronics	4
ECO 2010 or ECO 2020 or ECO 1000	Principles of Microeconomics or Principles of Macroeconomics or Survey of Economics	4
ENG 3050	Technical Communicational: Reports	3
Credits		17

Second Semester

PHI 1120 or PHI 2320	Professional Ethics or Introduction to Ethics	3
ECE 4330	Linear Systems and Signals	4
ECE 4570	Fundamentals of Microelectronic Devices	3
Any (GL) Course - Global Learning		3
Electrical, Computer or Biomedical Electronics and Systems Option Course		4
Credits		17

Fourth Year

First Semester

Electrical, Computer or Biomedical Electronics and Systems Option Courses			8
ECE 4700	Introduction to Communication Theory	4	
ECE 4340 or ECE 4331	Microcomputer Based Instrumental Laboratory or Systems and Signals Laboratory	2	
ENG 3060	Technical Communication II: Presentations	3	
Credits		17	

Second Semester

Any (DEI) Course - Diversity, Equity & Inclusion		3
ECE 4600	Capstone Design I	4
Any ECE Electives		8
Credits		15
Total Credits		126

* Students are required to take either PHY 2171 along with PHY 2175 **OR** take PHY 2181 along with PHY 2185. The Electrical Engineering department recommends taking PHY 2181.

Biomedical Electronics and Systems Option

Code	Title	Credits
ECE 5100	Quantitative Physiology	4
ECE 6180	Biomedical Instrumentation	4
Select one of the following:		4
ECE 5690	Introduction to Digital Image Processing	
ECE 5575	Introduction to Micro and Nano Electro Mechanical Systems (MEMS/NEMS)	
ECE 5425	Robotic Systems I	
Total Credits		12

Computer Option

Code	Title	Credits
ECE 4050	Algorithms and Data Structures	4
ECE 4680	Computer Architecture	4
ECE 5650	Computer Networking and Network Programming	4
Total Credits		12

Electrical Option

Code	Title	Credits
ECE 4470	Control Systems I	4
ECE 4800	Electromagnetic Fields and Waves I	4
ECE Elective		4
Total Credits		12

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.