

BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING, COMPUTER/DIGITAL TRACK

Through the Electrical Engineering program at Youngstown State University, you'll develop competency in all aspects of electrical engineering and its related fields. You'll take coursework anchored in engineering, math and physics that will allow you to solve complex problems and design intricate systems. Along the way, you'll also refine your communication skills and learn how to ethically and responsibly deploy your engineering skills.

Electrical engineers have homes in a large assortment of industries, from power generation and automotive manufacturing to biomedical development and consumer product design. You may even find yourself using your engineering expertise to serve your country in the military.

With your bachelor's degree in hand, you'll be the person advancing the products and systems that advance society.

MAJOR

Design projects, computer simulations, and hands-on laboratory sessions are the pillars of the Electrical Engineering major at YSU. Students enrolled in the program may choose from three options that prepare graduates for a large variety of professional positions or advanced studies:

- Traditional Option (<https://ysu.edu/academics/science-technology-engineering-mathematics/electrical-engineering-major/#panel0>)
- Computer/Digital Option (<https://ysu.edu/academics/science-technology-engineering-mathematics/electrical-engineering-major/#panel1>)
- Biomedical Option (<https://ysu.edu/academics/science-technology-engineering-mathematics/electrical-engineering-major/#panel2>)

COURSE	TITLE	S.H.
FIRST YEAR REQUIREMENT - STUDENT SUCCESS		
YSU 1500	Success Seminar	1-2
or SS 1500	Strong Start Success Seminar	
or HONR 1500	Intro to Honors	
General Education Requirements		
ENGL 1550	Writing 1	3-4
or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
CMST 1545	Communication Foundations	3
Gen Ed Math met through major		
Natural Science Gen Ed (9 s.h.)		
CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
PHYS 2610	General Physics 1	4
PHYS 2610L	General Physics Laboratory 1	1
Arts and Humanities (6 s.h.)		
Arts and Humanities (select 1 course)		
PHIL 2626	Engineering Ethics	3
Social Science (6 s.h.)		
Social Science (select 1 course)		
ECON 2610	Principles 1: Microeconomics	3
Social and Personal Awareness (6 s.h.)		
Major Requirements		
ECEN 1521 & 1521L	Digital Circuits and Digital Circuits Laboratory	4
	Lecture is 3 sh lab is 1 sh	
ECEN 2611	Instrumentation and Computation Lab 1	1

ECEN 2612	Instrumentation and Computation Lab 2	1
ECEN 2632	Basic Circuit Theory 1	3
ECEN 2633	Basic Circuit Theory 2	3
ECEN 3710	Signals and Systems	3
ECEN 3711	Intermediate Laboratory 1	1
ECEN 3712	Intermediate Laboratory 2	1
ECEN 3733	Digital Circuit Design	3
ECEN 3741	Electromagnetic Fields 1	3
ECEN 3742	Electromagnetic Fields 2	3
ECEN 3771	Digital and Analog Circuits 1	3
ECEN 4803 & 4803L	Linear Control Systems and Linear Control Systems Laboratory	4
ECEN 4811	Senior Laboratory	1
ECEN 4844	Electromagnetic Energy Conversion	3
ECEN 4899	Senior Design Project	3
ECEN 4899L	Senior Design Project Lab	1
Computer Engineering/Science		
CSIS 2610	Programming and Problem-Solving	3
CSIS 2610L	Programming and Problem-Solving Lab	1
ECEN 3734	Computer Design	3
CSIS 3700	Data Structures and Objects	3
CSIS 3700L	Data Structures and Objects Lab	1
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
ENGR 1560	Engineering Computing	2
MECH 2620	Statics and Dynamics	3
ISEN 2610	Engineering Statistics	3
CSCI/ECEN Electives		
Select 8 s.h. of 3700 level or higher CSCI/ECEN electives.		8
Science		
PHYS 3705	Thermodynamics and Classical Statistical Dynamics	3
Math Minor -one course counts toward Gen Ed		
MATH 1571	Calculus 1	4
MATH 1572	Calculus 2	4
MATH 2673	Calculus 3	4
MATH 3705	Differential Equations	3
MATH 3718	Linear Algebra and Discrete Mathematics for Engineers	3
Total Semester Hours		129-131
Year 1		
Fall		S.H.
YSU 1500	Success Seminar	1-2
or SS 1500	or Strong Start Success Seminar	
or HONR 1500	or Intro to Honors	
MATH 1571	Calculus 1	4
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
CHEM 1515 & 1515L	General Chemistry 1 and General Chemistry 1 Laboratory	4
ENGL 1550	Writing 1	3-4
or ENGL 1549	or Writing 1 with Support	
Semester Hours		15-17
Spring		
MATH 1572	Calculus 2	4
ENGR 1560	Engineering Computing	2
ECEN 1521 & 1521L	Digital Circuits and Digital Circuits Laboratory	4

ENGL 1551	Writing 2	3	General Education Requirement	3
CMST 1545	Communication Foundations	3		
Semester Hours		16	Semester Hours	17
			Total Semester Hours	129-131

Year 2**Fall**

MATH 2673	Calculus 3	4
ECEN 2632	Basic Circuit Theory 1	3
ECEN 2611	Instrumentation and Computation Lab 1	1
PHYS 2610 & 2610L	General Physics 1 and General Physics Laboratory 1	5
General Education Requirement		3
Semester Hours		16

Spring

MATH 3705	Differential Equations	3
ECEN 2633	Basic Circuit Theory 2	3
MATH 3718	Linear Algebra and Discrete Mathematics for Engineers	3
ECEN 2612	Instrumentation and Computation Lab 2	1
MECH 2620	Statics and Dynamics	3
General Education Requirement		3
Semester Hours		16

Year 3**Fall**

ECEN 3711	Intermediate Laboratory 1	1
ECEN 3733	Digital Circuit Design	3
ECEN 3741	Electromagnetic Fields 1	3
ECEN 3771	Digital and Analog Circuits 1	3
CSIS 2610	Programming and Problem-Solving	3
CSIS 2610L	Programming and Problem-Solving Lab	1
ISEN 2610	Engineering Statistics	3
Semester Hours		17

Spring

ECEN 3712	Intermediate Laboratory 2	1
ECEN 3710	Signals and Systems	3
ECEN 3734	Computer Design	3
ECEN 3742	Electromagnetic Fields 2	3
ECEN 4844	Electromagnetic Energy Conversion	3
CSIS 3700	Data Structures and Objects	3
CSIS 3700L	Data Structures and Objects Lab	1
Semester Hours		17

Year 4**Fall**

ECEN 4803 & 4803L	Linear Control Systems and Linear Control Systems Laboratory	4
ECEN 4811	Senior Laboratory	1
CSCI/ECEN Elective		4
PHYS 3705	Thermodynamics and Classical Statistical Dynamics	3
ECON 2610	Principles 1: Microeconomics	3
Semester Hours		15

Spring

ECEN 4899	Senior Design Project	3
ECEN 4899L	Senior Design Project Lab	1
PHIL 2626	Engineering Ethics	3
CSCI/ECEN Elective		4
General Education Requirement		3

Student Outcomes

The following (1 through 7) Student Outcomes support the program educational objectives. Attainment of these outcomes by students by the time of their graduation prepares graduating students to enter the professional practice of engineering.

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.