

ELECTRICAL ENGINEERING, CO-OP OPTION, BS

Bachelor of Science in Electrical Engineering with Co-op (440005BS)

This option of the undergraduate program in Electrical Engineering includes a cooperative education component.

The following information has official approval of the **Department of Electrical and Computer Engineering** and **The College of Engineering and Polymer Science**, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. Students should refer to the Degree Progress Report (DPR) which is definitive for graduation requirements. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others.* The transfer process is completed through an appointment with your academic advisor.

Requirements Summary

Code	Title	Hours
	General Education Requirements (https://bulletin.uakron.edu/undergraduate/general-education/)*	28
	Science	12
	Mathematics and Statistics	17
	General Engineering	8
	Computer Engineering	7
	Electrical Engineering	40
	Capstone Design Project	7
	Electrical Engineering Electives	18
	Total Hours	137

* Several courses required for the major also satisfy General Education requirements. The University minimum of 34 credits are required for General Education and credit for these courses will apply to both.

General Education Courses

Code	Title	Hours
Students pursuing a bachelor's degree must complete three tiers of General Education coursework. Tiers I and II provide students with foundational skills and breadth of disciplinary knowledge. Tier III courses require students to integrate knowledge, understand diverse perspectives, and think critically about complex issues. Courses tagged for Tier III may also fulfill major or Disciplinary Area requirements.		
Tier I: Academic Foundations		12
	<i>Quantitative Reasoning: 3 credit hours</i>	
	<i>Speaking: 3 credit hours</i>	
	<i>Writing: 6 credit hours</i>	
Tier II: Disciplinary Areas		22
	<i>Arts/Humanities: 9 credit hours</i>	

Natural Sciences: 7 credit hours

Social Sciences: 6 credit hours

Tier III: Tagged Courses

Select one class from each of the following subcategories:

Complex Systems

Critical Thinking

Domestic Diversity

Global Diversity

Review the General Education Requirements page for detailed course listings.

Total Hours 34

Science

Code	Title	Hours
3150:151	Principles of Chemistry I	3
3150:152	Principles of Chemistry I Laboratory	1
3650:291	Elementary Classical Physics I	4
3650:292	Elementary Classical Physics II	4
	Total Hours	12

Mathematics and Statistics

Code	Title	Hours
3450:221	Analytic Geometry-Calculus I	4
3450:222	Analytic Geometry-Calculus II	4
3450:223	Analytic Geometry-Calculus III	4
3450:335	Introduction to Ordinary Differential Equations	3
3470:401	Probability and Statistics for Engineers	2
	Total Hours	17

General Engineering

Code	Title	Hours
4300:201	Statics	3
4300:202	Introduction to Mechanics of Solids	3
or 4600:203	Dynamics	
4200:305	Materials Science	2
or 4600:305	Thermal Science	
	Total Hours	8

Computer Engineering

Code	Title	Hours
4450:208	Programming for Engineers	3
4450:220	Digital Logic Design	4
	Total Hours	7

Electrical Engineering

Code	Title	Hours
4400:101	Tools for Electrical Engineering	3
4400:230	Circuits I Laboratory	1
4400:231	Circuits I	3
4400:330	Circuits II Laboratory	1
4400:332	Circuits II	3

4400:340	Signals & Systems	4
4400:341	Introduction to Communication Systems	3
4400:353	Electromagnetics I	4
4400:354	Electromagnetics II	3
4400:360	Physical Electronics	3
4400:361	Electronic Design	4
4400:371	Control Systems I	4
4400:381	Energy Conversion	4
Total Hours		40

Capstone Design Project

Code	Title	Hours
4400:309	Design Project Seminar - Electrical Engineering	1
4400:401	Senior Design Project I - Electrical Engineering	3
4400:402	Senior Design Project II - Electrical Engineering	3
Total Hours		7

Code Title Hours
Select 18 credits from the following list, according to departmental Breadth and Depth requirements: 18

4400:301	Undergraduate Research I: Electrical Engineering	
4400:302	Undergraduate Research II: Electrical Engineering	
4400:303	Undergraduate Research III: Electrical Engineering	
4400:434	Active Circuits	
4400:441	Digital Communication	
4400:445	Wireless Communications	
4400:447	Random Signals	
4400:448	Optical Communication Networks	
4400:451	Electromagnetic Compatibility	
4400:453	Antenna Theory	
4400:455	Microwaves	
4400:461	Optical Electronics & Photonic Devices	
4400:469	Introduction to Sensors and Actuators	
4400:472	Control Systems II	
4400:481	Modern Power Systems	
4400:483	Power Electronics I	
4400:485	Electric Motor Drives	
4400:486	Dynamics of Electric Machines	
4400:487	Electromagnetic Design of Electric Machines	
4400:488	Control of Machines	
4400:489	Electric and Hybrid Vehicles	
4400:498	Special Topics: Electrical Engineering	
4450:320	Computer Systems	
4450:325	Operating Systems Concepts	
4450:367	VLSI Design	
4450:410	Embedded Scientific Computing	
4450:415	System Simulation	
4450:420	Computer Systems Design	
4450:422	Embedded Systems Interfacing	
4450:427	Computer Networks	
4450:440	Digital Signal Processing	
4450:462	Analog Integrated Circuit Design	

4450:465	Programmable Logic	
4450:467	VLSI Circuits & Systems	
Total Hours		18

Recommended Sequence

1st Year

Fall Semester	Hours	
3150:151	Principles of Chemistry I ¹	3
3150:152	Principles of Chemistry I Laboratory	1
3300:111	English Composition I ^{1,2}	3
3450:221	Analytic Geometry-Calculus I ¹	4
4400:101	Tools for Electrical Engineering	3
Hours		14

Spring Semester

3300:112	English Composition II ^{1,5}	3
3450:222	Analytic Geometry-Calculus II ¹	4
3650:291	Elementary Classical Physics I ¹	4
4450:220	Digital Logic Design	4
General Education or Honors Distribution ⁴		3
Hours		18

2nd Year

Fall Semester

3450:223	Analytic Geometry-Calculus III ¹	4
3650:292	Elementary Classical Physics II ¹	4
4400:230	Circuits I Laboratory	1
4400:231	Circuits I	3
General Education or Honors Distribution ⁴		3
General Education or Honors Distribution ⁴		3
Hours		18

Spring Semester

3450:335	Introduction to Ordinary Differential Equations	3
4300:201	Statics	3
4400:330	Circuits II Laboratory	1
4400:332	Circuits II	3
4450:208	Programming for Engineers	3
General Education or Honors Distribution ⁴		3
Hours		16

Summer Semester

4100:300	Cooperative Education Work Period (Possible)	0
Hours		0

3rd Year

Fall Semester

4300:202	Introduction to Mechanics of Solids or 4600:203 or Dynamics	3
4400:340	Signals & Systems	4
4400:353	Electromagnetics I	4
4400:360	Physical Electronics	3
4400:381	Energy Conversion	4

4400:301	Undergraduate Research I: Electrical Engineering (Optional)	
	Hours	18
Spring Semester		
4100:301	Cooperative Education Work Period	0
	Hours	0
Summer Semester		
3470:401	Probability and Statistics for Engineers	2
4200:305	Materials Science	2
or 4600:305	or Thermal Science	
4400:302	Undergraduate Research II: Electrical Engineering (Optional)	
	Hours	4
4th Year		
Fall Semester		
4100:302	Cooperative Education Work Period	0
	Hours	0
Spring Semester		
4450:309	Design Project Seminar - Computer Engineering	1
4400:341	Introduction to Communication Systems	3
4400:354	Electromagnetics II	3
4400:361	Electronic Design	4
4400:371	Control Systems I	4
4400:303	Undergraduate Research III: Electrical Engineering (Optional)	
	Hours	15
Summer Semester		
4100:403	Cooperative Education Work Period	0
	Hours	0
5th Year		
Fall Semester		
4400:401	Senior Design Project I - Electrical Engineering	3
	Electrical Engineering Elective	3
	Electrical Engineering Elective	3
	Electrical Engineering Elective	3
	General Education or Honors Distribution ⁴	3
	Hours	15
Spring Semester		
4400:402	Senior Design Project II - Electrical Engineering	3
	Electrical Engineering Elective	3
	Electrical Engineering Elective	3
	Electrical Engineering Elective	3
	General Education or Honors Distribution ⁴	3
	General Electives	4
	Hours	19
	Total Hours	137

- ¹ Honors sections may be available; check the schedule of classes.
- ² The Electrical and Computer Engineering Department recommends that English Composition I be used to satisfy writing course requirement but other choices are available. See the General Education Program for details.
- ³ Check General Education Program or Honors Distribution to find courses that satisfy the second writing course requirement.
- ⁴ Credit hours shown for General Education or Honors Distribution are general guidelines only. These courses should be chosen in accordance with the appropriate General Education curriculum guide (for non-honors students) or Honors Distribution (for honors students). Honors students must also ensure that their course selections meet additional requirements not shown on this curriculum guide.
- ⁵ While 3300:112 English Composition II is preferred, 2020:222 Technical Report Writing is accepted to fulfill the English composition elective.

Notes:

- Up to three credits of undergraduate research in Electrical Engineering may be applied to program requirements as Electrical Engineering Electives. Students may take at most one credit of undergraduate research in a semester.
- See Electrical and Computer Engineering Departmental Office for Approved Electrical Engineering Electives (including Breadth and Depth requirements)