Bachelor of Science in Electrical Engineering - Bioelectrical Engineering Concentration with Co-op

Learn more about the Bachelor of Science in Electrical Engineering (https://www.temple.edu/academics/degree-programs/electrical-engineering-major-en-ece-bsee).

Cooperative Education Program

A Cooperative Education (Co-Op) is an optional program available at the College of Engineering where you have the opportunity to gain professional work experience before graduation. It is designed to give you the chance to apply the knowledge learned in the classroom to real life problems. You will be exposed to the latest technology and new ideas at a worksite helping you understand your field of work more extensively. During the Co-Op, you will make valuable connections with professionals in your field. A cooperative education can enhance and strengthen you academically, professionally and personally.

Summary of Degree Requirements

University Requirements

All new students are required to complete the university's General Education (GenEd (http://bulletin.temple.edu/undergraduate/general-education)) curriculum.

All Temple students must take a minimum of two writing-intensive courses for a total of at least six credits. The writing-intensive course credits are counted as part of the major; they are not General Education (GenEd) or elective credits. The writing-intensive courses must be completed at Temple University and students may not transfer in credits to satisfy this requirement. The specific writing-intensive courses required for this major are:

Code	Title	Credit Hours
ENGR 2196	Technical Communication	3
or ENGR 2996	Honors Technical Communication by Design	
ENGR 4296	Senior Design Project II	3
or ENGR 4996	Honors Senior Design Project II	

College Requirements

The degree of Bachelor of Science in Electrical Engineering with a concentration in Bioelectrical Engineering and the optional Cooperative Education program may be conferred upon satisfactory completion of a minimum of 134 semester hours of credit with a minimum GPA of 2.0 overall and in the major. Students must also score a minimum grade of C- in each of the following courses before they can take other junior and senior level courses:

Code	Title	Credit Hours
ECE 2332	Principles of Electric Circuits	4
ECE 2612	Digital Circuit Design	3
ECE 3512	Signals: Continuous and Discrete	4
or ECE 3912	Honors Signals: Continuous and Discrete	

Program Requirements

Code	Title	Credit Hours
Required Math & Basic Science Courses		
MATH 1041	Calculus I	4
or MATH 1941	Honors Calculus I	
MATH 1042	Calculus II	4
or MATH 1942	Honors Calculus II	
MATH 2043	Calculus III	4
or MATH 2943	Honors Calculus III	
MATH 3041	Differential Equations I	3
or MATH 3941	Honors Differential Equations I	
ECE 3522	Stochastic Processes in Signals and Systems	3

ENGR 2011	Engineering Analysis & Applications	3
PHYS 1061	Elementary Classical Physics I	4
or PHYS 1961	Honors Elementary Classical Physics I	
PHYS 1062	Elementary Classical Physics II	4
or PHYS 1962	Honors Elementary Classical Physics II	
CHEM 1035	Chemistry for Engineers	3
CHEM 1033	General Chemistry Laboratory I	1
or CHEM 1953	Honors Chemical Science Laboratory I	
BIOL 1011	General Biology I	4
Required General Education Courses		
Select one of the following:		4
ENG 0802	Analytical Reading and Writing	
ENG 0812	Analytical Reading and Writing: ESL	
ENG 0902	Honors Literature/Reading/Writing	
IH 0851	Intellectual Heritage I: The Good Life	3
or IH 0951	Honors Intellectual Heritage I: The Good Life	
IH 0852	Intellectual Heritage II: The Common Good	3
or IH 0952	Honors Intellectual Heritage II: The Common Good	
GenEd 08xx or 09xx (U.S. Society)		3
GenEd 08xx or 09xx (Global/World Society)		3
GenEd 08xx or 09xx (Human Behavior)		3
GenEd 08xx or 09xx (The Arts)		3
GenEd 08xx or 09xx (Race and Diversity)		3
Required Electrical and Bioelectrical Engineering Courses		
ECE 2332	Principles of Electric Circuits	4
ECE 2333	Principles of Electric Circuits Lab	1
ECE 2612	Digital Circuit Design	3
ECE 2613	Digital Circuit Design Laboratory	1
ECE 3512	Signals: Continuous and Discrete	4
or ECE 3912	Honors Signals: Continuous and Discrete	
ECE 3712	Introduction to Electromagnetic Fields and Waves	3
ECE 3612	Processor Systems	3
or ECE 3914	Honors Microprocessor Systems	
ECE 3613	Processor Systems Laboratory	1
or ECE 3915	Honors Microprocessor Systems Lab	
ECE 3412	Classical Control Systems	3
ECE 3413	Classical Control Laboratory	1
ECE 4522	Digital Signal Processing	3
KINS 1223	Human Anatomy and Physiology I	4
KINS 1224	Human Anatomy and Physiology II	4
Required Engineering Courses		
ENGR 1101	Introduction to Engineering & Engineering Technology	3
or ENGR 1901	Honors Introduction to Engineering	
ENGR 1102	Introduction to Engineering Problem Solving	3
ENGR 2196	Technical Communication (WI)	3
or ENGR 2996	Honors Technical Communication by Design	
ENGR 4169	Engineering Seminar	1
ENGR 4176	Senior Design Project I for Electrical Engineering	2
ENGR 4296	Senior Design Project II (WI)	3
or ENGR 4996	Honors Senior Design Project II	
CIS 1057	Computer Programming in C	4
or ECE 1111	Engineering Computation I	

Required Electives		
Electrical Engineering or Biology Technical Electives - may use a combination of 3 credit and/or 4 credit courses		9
Free Elective		3
Required Cooperative Education Courses		
ENGR 2181	Co-Op Work Experience I	3
ENGR 3181	Co-Op Work Experience II	3
Total Credit Hours		134

Suggested Academic Plan

Below is a suggested five-year plan for the Co-Op program leading to the Bachelor of Science in Electrical Engineering with a concentration in Bioelectrical Engineering. The minimum requirement for graduation is 134 semester hours.

Please note that this is a **suggested** academic plan. Depending on your situation, your academic plan may look different.

Bachelor of Science in Electrical Engineering: Bioelectrical Engineering Concentration with Cooperative Education

Requirements for New Students starting in the 2019-2020 Academic Year

Year 1		
Fall		**Credit Hours**
MATH 1041 or 1941	Calculus I	4
CHEM 1035	Chemistry for Engineers	3
CHEM 1033 or 1953	General Chemistry Laboratory I	1
ENGR 1101 or 1901	Introduction to Engineering Engineering Technology	3
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW]	4
	Term Credit Hours	15
Spring		
MATH 1042 or 1942	Calculus II	4
PHYS 1061 or 1961	Elementary Classical Physics I	4
ENGR 1102	Introduction to Engineering Problem Solving	3
Select one of the following:		4
CIS 1057	Computer Programming in C	
ECE 1111	Engineering Computation I	
	Term Credit Hours	15
Year 2		
Fall		
MATH 2043 or 2943	Calculus III	4
PHYS 1062 or 1962	Elementary Classical Physics II	4
ECE 2332	Principles of Electric Circuits	4
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY]	3
	Term Credit Hours	15
Spring		
MATH 3041 or 3941	Differential Equations I	3
ECE 2333	Principles of Electric Circuits Lab	1
ECE 2612	Digital Circuit Design	3
ECE 2613	Digital Circuit Design Laboratory	1
ENGR 2011	Engineering Analysis Applications	3
BIOL 1011	General Biology I	4
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
	Term Credit Hours	18
Year 3		
Fall		
ECE 3512 or 3912	Signals: Continuous and Discrete	4

ECE 3612 or 3914	Processor Systems	3
ECE 3613 or 3915	Processor Systems Laboratory	1
ECE 3712	Introduction to Electromagnetic Fields and Waves	3
KINS 1223	Human Anatomy and Physiology I	4
	Term Credit Hours	15
Spring		
ECE 3412	Classical Control Systems	3
ECE 3413	Classical Control Laboratory	1
ECE 3522	Stochastic Processes in Signals and Systems	3
KINS 1224	Human Anatomy and Physiology II	4
GenEd Breadth Course		3
ENGR 4169	Engineering Seminar	1
ENGR 2196 or 2996	Technical Communication [WI]	3
	Term Credit Hours	18
Year 4		
Fall		
ENGR 2181	Co-Op Work Experience I	3
	Term Credit Hours	3
Spring		
ENGR 3181	Co-Op Work Experience II	3
	Term Credit Hours	3
Year 5		
Fall		
ENGR 4176	Senior Design Project I for Electrical Engineering	2
ECE 4522	Digital Signal Processing	3
Electrical Engineering/Biology	Technical Elective[1]	3
GenEd Breadth Course		3
GenEd Breadth Course		3
Free Elective		3
	Term Credit Hours	17
Spring		
ENGR 4296 or 4996	Senior Design Project II [WI]	3
Electrical Engineering Technical Elective[1]		3
Electrical Engineering Technical Elective[1]		3
GenEd Breadth Course		3
GenEd Breadth Course		3
	Term Credit Hours	15
	Total Credit Hours:	134

[1] Students may satisfy no more than one Electrical Engineering Technical Elective with 3 credits of Independent Study or Independent Research coursework. Students must be granted prior approval from the department.

Technical Electives

Code	Title	Credit Hours
ECE 3312	Microelectronics I	3
ECE 3313	Microelectronics I Laboratory	1
ECE 3622	Embedded System Design	3
ECE 3623	Embedded System Design Laboratory	1
ECE 3722	Electromagnetic Wave Propagation	3
ECE 3723	Electromagnetic Wave Propagation Laboratory	1
ECE 3732	Electromechanical Energy Systems	3

ECE 3733	Electromechanical Energy Systems Laboratory	1
ECE 3822	Engineering Computation II	3
ECE 4312	Microelectronics II	3
ECE 4322	VLSI Systems Design	3
ECE 4412	Modern Control Theory	3
ECE 4542	Telecommunications Engineering	3
ECE 4422	Digital Control Systems	3
ECE 4512	Digital Communication Systems	3
ECE 4513	Digital Communication Systems Laboratory	1
ECE 4612	Advanced Processor Systems	3
ECE 4712	Power System Analysis	3
ENGR 3033	Entrepreneurial Engineering	3
ENGR 4116	Spacecraft Systems Engineering	3
ECE 3082	Independent Study in Electrical Engineering	3
ECE 3091	Independent Research in Electrical Engineering	3