Bachelor of Science in Electrical Engineering - Computer Engineering Concentration

Learn more about the Bachelor of Science in Electrical Engineering.

The objective of the Computer Engineering concentration is to prepare students for a career in the area of Computer Engineering as it relates to the design of integrated software/hardware systems with both high- and low-level computer systems programming and applications to electrical systems. Computer engineers are responsible for the design, implementation, and application of computers and digital systems. The field covers hardware, software, and the interaction between them. The Computer Engineering concentration integrates courses on computer science fundamentals from the Department of Computer and Information Sciences of Temple University into the curriculum.

Summary of Degree Requirements

University Requirements

All new students are required to complete the university's General Education (GenEd) 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 Computer Engineering may be conferred upon satisfactory completion of a minimum of 128 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	
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 & Computer 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 3612	Processor Systems	3
or ECE 3914	Honors Microprocessor Systems	
ECE 3613	Processor Systems Laboratory	1
or ECE 3915	Honors Microprocessor Systems Lab	
ECE 3622	Embedded System Design	3
ECE 3623	Embedded System Design Laboratory	1
ECE 4512	Digital Communication Systems	3
ECE 4513	Digital Communication Systems Laboratory	1
ECE 4612	Advanced Processor Systems	3
ECE 4532	Data and Computer Communication	3
CIS 1057	Computer Programming in C	4
or ECE 1111	Engineering Computation I	
CIS 1068	Program Design and Abstraction	4
or CIS 1968	Honors Program Design and Abstraction	
CIS 1166	Mathematical Concepts in Computing I	4
or CIS 1966	Honors Mathematical Concepts in Computing I	
CIS 2168	Data Structures	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	
Required Elective Courses		
Electrical Engineering or Computer & Information Science Technical Electives		6
Free Elective		2
Total Credit Hours		128

Suggested Academic Plan

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: Computer Engineering Concentration
Requirements for New Students starting in the 2020-2021 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
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
GenEd Breadth Course		3
	Term Credit Hours	17
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
ENGR 2196 or 2996	Technical Communication [WI]	3
GenEd Breadth Course		3
GenEd Breadth Course		3
	Term Credit Hours	17

Spring		
ECE 3622	Embedded System Design	3
ECE 3623	Embedded System Design Laboratory	1
ECE 3522	Stochastic Processes in Signals and Systems	3
CIS 1068 or 1968	Program Design and Abstraction	4
ENGR 4169	Engineering Seminar	1
GenEd Breadth Course		3
Free Elective		2
	Term Credit Hours	17
Year 4		
Fall		
ENGR 4176	Senior Design Project I for Electrical Engineering	2
ECE 4512	Digital Communication Systems	3
ECE 4513	Digital Communication Systems Laboratory	1
ECE 4612	Advanced Processor Systems	3
CIS 1166 or 1966	Mathematical Concepts in Computing I	4
Electrical Engineering/Computer & Information Science Technical Elective[1]		3
	Term Credit Hours	16
Spring		
ENGR 4296 or 4996	Senior Design Project II [WI]	3
Electrical Engineering/Computer & Information Science Technical Elective[1]		3
ECE 4532	Data and Computer Communication	3
GenEd Breadth Course		3
CIS 2168	Data Structures	4
	Term Credit Hours	16
	Total Credit Hours:	128

[1]   Students may satisfy no more than one Electrical Engineering/CIS Technical Elective with 3 credits of Independent Study, Independent Research or Co-Op 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 3412	Classical Control Systems	3
ECE 3413	Classical Control Laboratory	1
ECE 3622	Embedded System Design	3
ECE 3623	Embedded System Design Laboratory	1
ECE 3712	Introduction to Electromagnetic Fields and Waves	3
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 4322	VLSI Systems Design	3
ECE 4522	Digital Signal Processing	3
ECE 4542	Telecommunications Engineering	3
ECE 4712	Power System Analysis	3
ECE 4312	Microelectronics II	3
ECE 4412	Modern Control Theory	3
ECE 4422	Digital Control Systems	3
ENGR 3033	Entrepreneurial Engineering	3

ENGR 4116	Spacecraft Systems Engineering	3
ENGR 2181	Co-Op Work Experience I	3
or ENGR 3181	Co-Op Work Experience II	
ECE 3082	Independent Study in Electrical Engineering	3
ECE 3091	Independent Research in Electrical Engineering	3

CIS: Approved Electives