

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

Learn more about the Bachelor of Science in Electrical Engineering.

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) 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 or ENGR 2996 | Technical Communication Honors Technical Communication | 3 |
| ENGR 4296 or ENGR 4996 | Senior Design Project II Honors Senior Design Project II | 3 |

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 2342 | Circuits and Electronics I | 5 |
| ECE 2612 | Digital Circuit Design | 3 |
| ECE 3516 or ECE 3916 | Signals and Systems Honors Signals and Systems | 5 |

Program Requirements

| Code | Title | Credit Hours |
|--|---|--------------|
| Required Math & Basic Science Courses | | |
| MATH 1041 or MATH 1941 | Calculus I Honors Calculus I | 4 |
| MATH 1042 or MATH 1942 | Calculus II Honors Calculus II | 4 |
| MATH 2041 or MATH 2941 | Differential Equations I Honors Differential Equations I | 3 |
| ECE 3522 | Stochastic Processes in Signals and Systems | 3 |
| ENGR 2011 | Engineering Analysis & Applications | 3 |
| ENGR 2013 | Engineering Analysis and Applications Lab | 1 |
| PHYS 1061 | Elementary Classical Physics I | 4 |

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|--|--|---|
| 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 1012 | General Biology II | 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 1111 | Engineering Computation I | 4 |
| ECE 2342 | Circuits and Electronics I | 5 |
| ECE 2352 | Circuits and Electronics II | 5 |
| ECE 2612 | Digital Circuit Design | 3 |
| ECE 2613 | Digital Circuit Design Laboratory | 1 |
| ECE 3516 | Signals and Systems | 5 |
| or ECE 3916 | Honors Signals and Systems | |
| 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 3712 | Introduction to Electromagnetic Fields and Waves | 3 |
| ECE 3822 | Engineering Computation II | 3 |
| 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 | |
| ECE 4176 | Senior Design Project I: ECE | 3 |
| ENGR 4296 | Senior Design Project II (WI) | 3 |
| or ENGR 4996 | Honors Senior Design Project II | |
| Required Electives | | |
| ECE Technical Elective | | 4 |
| Math, Science, or Engineering Elective | | 3 |
| Free Elective | | 3 |
| Required Cooperative Education Courses | | |

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|---------------------------|--------------------------|------------|
| 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 2022-2023 Academic Year

| Year 1 | | Credit Hours |
|--------------------------|--|--------------|
| Fall | | |
| MATH 1041 or 1941 | Calculus I | 4 |
| PHYS 1061 or 1961 | Elementary Classical Physics I | 4 |
| 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 1062 or 1962 | Elementary Classical Physics II | 4 |
| CHEM 1035 | Chemistry for Engineers | 3 |
| CHEM 1033 or 1953 | General Chemistry Laboratory I | 1 |
| ENGR 1102 | Introduction to Engineering Problem Solving | 3 |
| Term Credit Hours | | 15 |
| Year 2 | | |
| Fall | | |
| ENGR 2011 | Engineering Analysis & Applications | 3 |
| ENGR 2013 | Engineering Analysis and Applications Lab | 1 |
| ECE 1111 | Engineering Computation I | 4 |
| ECE 2342 | Circuits and Electronics I | 5 |
| IH 0851 or 0951 | Intellectual Heritage I: The Good Life [GY] | 3 |
| Term Credit Hours | | 16 |
| Spring | | |
| MATH 2041 or 2941 | Differential Equations I | 3 |
| ECE 2612 | Digital Circuit Design | 3 |
| ECE 2613 | Digital Circuit Design Laboratory | 1 |
| ECE 2352 | Circuits and Electronics II | 5 |
| IH 0852 or 0952 | Intellectual Heritage II: The Common Good [GZ] | 3 |
| Term Credit Hours | | 15 |
| Year 3 | | |
| Fall | | |
| ECE 3516 or 3916 | Signals and Systems | 5 |
| 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 | | 18 |
| Spring | | |

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|--|--|------------|
| ECE 3522 | Stochastic Processes in Signals and Systems | 3 |
| ECE 3712 | Introduction to Electromagnetic Fields and Waves | 3 |
| ECE 3822 | Engineering Computation II | 3 |
| BIOL 1012 | General Biology II | 4 |
| GenEd Breadth Course | | 3 |
| Term Credit Hours | | 16 |
| 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 | | |
| ECE 4176 | Senior Design Project I: ECE | 3 |
| ECE 4522 | Digital Signal Processing | 3 |
| KINS 1223 | Human Anatomy and Physiology I | 4 |
| ECE Technical Elective | | 4 |
| GenEd Breadth Course | | 3 |
| Term Credit Hours | | 17 |
| Spring | | |
| ENGR 4296 or 4996 | Senior Design Project II [WI] | 3 |
| KINS 1224 | Human Anatomy and Physiology II | 4 |
| Math, Science, or Engineering Elective | | 3 |
| Free Elective | | 3 |
| GenEd Breadth Course | | 3 |
| Term Credit Hours | | 16 |
| Total Credit Hours: | | 134 |

ECE Technical Electives

| Code | Title | Credit Hours |
|----------|--|--------------|
| ECE 3412 | Classical Control Systems | 3 |
| ECE 3413 | Classical Control Laboratory | 1 |
| ECE 3432 | Robotic Control using Raspberry Pi Microcontroller | 3 |
| 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 3824 | Engineering Computation III | 3 |
| ECE 4110 | Special Topics | 1 to 4 |
| ECE 4312 | Microelectronics II | 3 |
| ECE 4322 | VLSI Systems Design | 3 |
| ECE 4412 | Modern Control Theory | 3 |
| ECE 4422 | Digital Control Systems | 3 |
| ECE 4512 | Digital Communication Systems | 3 |
| ECE 4513 | Digital Communication Systems Laboratory | 1 |
| ECE 4527 | Introduction to Machine Learning and Pattern Recognition | 3 |
| ECE 4532 | Data and Computer Communication | 3 |

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|----------|--------------------------------|---|
| ECE 4542 | Telecommunications Engineering | 3 |
| ECE 4612 | Advanced Processor Systems | 3 |
| ECE 4712 | Power System Analysis | 3 |
| ECE 4722 | Power Electronics | 3 |

Math, Science, or Engineering Electives

| Code | Title | Credit Hours |
|---|-------|--------------|
| Any MATH course 2000-level or above | | 3 |
| Any course 2000-level or above from the College of Science & Technology | | 3 |
| Any course 2000-level or above from the College of Engineering | | 3 |