# Bachelor of Science in Engineering - Electromechanical Engineering Concentration

Learn more about the Bachelor of Science in Engineering.

The Bachelor of Science in Engineering with the Optional Concentration in Electromechanical Engineering (BSE-EME) integrates the tenets of Electrical Engineering and Mechanical Engineering to provide an interdisciplinary professional career in this burgeoning area. The program offers a relevant, stimulating, and effective course of undergraduate study to produce electromechanical engineers to meet the needs of the new century in robotics, process control and automation. The program emphasizes all aspects of electromagnetics, transducers, sensors, electronics, digital processing and mechanical principles to integrate these components into electromechanical devices and systems for automated manufacturing processes. Professional employment includes the analysis, design and installation of robotics and automation for diverse industries. The intent of the BSE-EME program is to provide better and more efficient electromechanical systems which will have a profound impact on the global society.

## Summary of 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 | |
| ENGR 4296 | Senior Design Project II | 3 |
| or ENGR 4996 | Honors Senior Design Project II | |

### Department and Major 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 2041 | Differential Equations I | 3 |
| or MATH 2941 | Honors Differential Equations I | |
| MATH 2043 | Calculus III | 4 |
| or MATH 2943 | Honors Calculus III | |
| Select one of the following: | | 3 |
| ENGR 2011 | Engineering Analysis & Applications | |
| MEE 3011 | Analysis and Computation of Linear Systems in Mechanical Engineering | |
| Select one of the following: | | 3 |
| CEE 3048 | Probability, Statistics & Stochastic Methods | |
| ISE 2101 | Applied Statistical Methods for Industrial and System Engineers | |
| 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 | |

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|---|---|---|
| **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 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 1117 | Engineering Graphics | 2 |
| or MEE 1117 | Fundamentals of Mechanical Engineering Design | |
| ENGR 2196 | Technical Communication | 3 |
| or ENGR 2996 | Honors Technical Communication | |
| ENGR 2331 | Engineering Statics | 3 |
| or ENGR 2931 | Honors Engineering Statics | |
| ENGR 2332 | Engineering Dynamics | 3 |
| ENGR 2333 | Mechanics of Solids | 3 |
| or ENGR 2933 | Honors Mechanics of Solids | |
| ENGR 3001 | Engineering Economics | 3 |
| ENGR 4169 | Engineering Seminar | 1 |
| ENGR 4172 | Senior Design Project I for Engineering | 2 |
| ENGR 4296 | Senior Design Project II | 3 |
| or ENGR 4996 | Honors Senior Design Project II | |
| 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 3612 | Processor Systems | 3 |
| or ECE 3914 | Honors Microprocessor Systems | |
| ECE 3613 | Processor Systems Laboratory | 1 |
| or ECE 3915 | Honors Microprocessor Systems Lab | |
| ECE 3732 | Electromechanical Energy Systems | 3 |
| ECE 3733 | Electromechanical Energy Systems Laboratory | 1 |
| MEE 3301 | Machine Theory and Design | 3 |
| ECE 1111 | Engineering Computation I | 4 |
| or CIS 1057 | Computer Programming in C | |
| Technical Elective #1 | | 3 |
| Technical Elective #2 | | 3 |
| Technical Elective #3 | | 3 |
| **Required Business Elective Courses** | | |
| Select two of the following | | 6 |
| ACCT 2101 | Financial Accounting | |
| or ACCT 2901 | Honors Financial Accounting | |

| | | |
|---|---|---|
| ACCT 2102 | Managerial Accounting | |
| or ACCT 2902 | Honors Managerial Accounting | |
| ECON 1101 | Macroeconomic Principles | |
| or ECON 1901 | Honors Macroeconomic Principles | |
| ECON 1102 | Microeconomic Principles | |
| or ECON 1902 | Honors Microeconomic Principles | |
| HRM 1101 | Leadership and Organizational Management | |
| or HRM 1901 | Honors Leadership and Organizational Management | |
| HRM 2501 | Introduction to Human Resource Management | |
| MKTG 2101 | Marketing Management | |
| or MKTG 2901 | Honors Marketing Management | |
| MSOM 3101 | Operations Management | |
| RMI 2101 | Introduction to Risk Management | |
| or RMI 2901 | Honors Introduction to Risk Management | |
| **Required Additional Electives** | | |
| Free Elective | | 2 |
| **Total Credit Hours** | | **128** |

## Suggested Academic Plan

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

### Bachelor of Science in Engineering (B.S.E.) - Electromechanical Engineering Concentration

#### Requirements for New Students starting in the 2022-2023 Academic Year

| | | |
|---|---|---|
| **Year 1** | | |
| **Fall** | | **Credit Hours** |
| ENGR 1101 or 1901 | Introduction to Engineering & Engineering Technology | 3 |
| MATH 1041 or 1941 | Calculus I | 4 |
| CHEM 1035 | Chemistry for Engineers | 3 |
| CHEM 1033 or 1953 | General Chemistry Laboratory I | 1 |
| 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: | | 2 |
| ENGR 1117 | Engineering Graphics | |
| MEE 1117 | Fundamentals of Mechanical Engineering Design | |
| Select one of the following: | | 4 |
| CIS 1057 | Computer Programming in C | |
| ECE 1111 | Engineering Computation I | |
| | **Term Credit Hours** | **17** |
| **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 |
| ENGR 2331 or 2931 | Engineering Statics | 3 |
| IH 0851 or 0951 | Intellectual Heritage I: The Good Life [GY] | 3 |
| | **Term Credit Hours** | **18** |
| **Spring** | | |
| MATH 2041 or 2941 | Differential Equations I | 3 |

| | | |
|---|---|---|
| ENGR 2332 | Engineering Dynamics | 3 |
| ENGR 2333 or 2933 | Mechanics of Solids | 3 |
| Business Elective #1 | | 3 |
| IH 0852 or 0952 | Intellectual Heritage II: The Common Good [GZ] | 3 |
| ECE 2333 | Principles of Electric Circuits Lab | 1 |
| | **Term Credit Hours** | **16** |
| **Year 3** | | |
| **Fall** | | |
| ECE 2612 | Digital Circuit Design | 3 |
| ECE 2613 | Digital Circuit Design Laboratory | 1 |
| ECE 3732 | Electromechanical Energy Systems | 3 |
| ECE 3733 | Electromechanical Energy Systems Laboratory | 1 |
| ENGR 2196 or 2996 | Technical Communication [WI] | 3 |
| GenEd Breadth Course | | 3 |
| Select one of the following: | | 3 |
| ENGR 2011 | Engineering Analysis & Applications | |
| MEE 3011 | Analysis and Computation of Linear Systems in Mechanical Engineering | |
| | **Term Credit Hours** | **17** |
| **Spring** | | |
| Technical Elective #1 | | 3 |
| ECE 3612 or 3914 | Processor Systems | 3 |
| ECE 3613 or 3915 | Processor Systems Laboratory | 1 |
| ENGR 4169 | Engineering Seminar | 1 |
| GenEd Breadth Course | | 3 |
| GenEd Breadth Course | | 3 |
| Select one of the following: | | 3 |
| CEE 3048 | Probability, Statistics & Stochastic Methods | |
| ISE 2101 | Applied Statistical Methods for Industrial and System Engineers | |
| | **Term Credit Hours** | **17** |
| **Year 4** | | |
| **Fall** | | |
| ENGR 4172 | Senior Design Project I for Engineering | 2 |
| MEE 3301 | Machine Theory and Design | 3 |
| Technical Elective #2 | | 3 |
| ENGR 3001 | Engineering Economics | 3 |
| GenEd Breadth Course | | 3 |
| | **Term Credit Hours** | **14** |
| **Spring** | | |
| ENGR 4296 or 4996 | Senior Design Project II [WI] | 3 |
| Technical Elective #3 | | 3 |
| Business Elective #2 | | 3 |
| GenEd Breadth Course | | 3 |
| Free Elective | | 2 |
| | **Term Credit Hours** | **14** |
| | **Total Credit Hours:** | **128** |

## Approved Technical Electives

| Code | Title | Credit Hours |
|---|---|---|
| ECE 3432 | Robotic Control using Raspberry Pi Microcontroller | 3 |
| ECE 3512 | Signals: Continuous and Discrete | 4 |
| ECE 3622 | Embedded System Design | 3 |

| | | |
|---|---|---|
| ECE 3623 | Embedded System Design Laboratory | 1 |
| ECE 3712 | Introduction to Electromagnetic Fields and Waves | 3 |
| ENGR 2181 | Co-Op Work Experience I | 3 |
| ENGR 3117 | Computer-Aided Design (CAD) | 3 |
| ENGR 3571 | Classical and Statistical Thermodynamics | 3 |
| MEE 3302 | Kinematics of Mechanisms | 3 |
| MEE 3422 | Modeling and Control of Electromechanical Systems | 3 |
| MEE 4411 | Introduction to Mobile Robotics | 3 |
| MEE 4412 | Modern Dynamics for Robotics | 3 |
| MEE 4413 | Robotic Manipulation | 3 |