Engineering BSE with Electromechanical Engineering Concentration

Note: This program is not accepting applications for the 2023-2024 academic year.

The following information is for students who matriculated into this program in the 2022-2023 academic year.

Overview

The cross-disciplinary 128-credit **Bachelor of Science in Engineering**, offered by the Department of Engineering, Technology and Management, combines learning from several areas to create unique skill sets that are highly marketable. The curriculum not only takes courses from several departments and offers concentrations or study plans in engineering but also provides a basis for further study in business, law, medicine or further study in an engineering graduate program. The optional interdisciplinary concentrations and study plans include:

- Computer Hardware and Software Engineering (study plan)
- Electromechanical Engineering (concentration)
- Energy and Power Engineering (concentration)
- Engineering Fundamentals (study plan)

To give students the opportunity to understand these specialties, the College provides a strong foundation in the basic sciences and mathematics in a common first year. The Department of Engineering, Technology, and Management then aims to bring together the in-demand cross-functional skill sets desired in many industries, including the analysis, design and development of systems for diverse applications. The curriculum emphasizes a rigorous treatment of the mathematical and scientific approach to the solution of engineering problems. The program has design across the curriculum and is capped with an integrated design experience in the form of a senior project.

The Bachelor of Science in Engineering program shall produce graduates who:

1. will be employed in industries, academia and state or federal government agencies;
2. will advance their professional standing through graduate and/or professional degrees or lifelong learning; and
3. will contribute to their profession and to society.

Electromechanical Engineering Concentration

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.

Campus Location: Main

Program Code: EN-ENGR-BSEN

Learn more about the Bachelor of Science in Engineering.

Students who matriculated prior to fall 2023 should refer to the Archives *to view the requirements for their Bulletin year.*

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	Capstone Senior Design Project	3
or ENGR 4996	Honors Capstone Senior Design Project	

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	
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 Writing About Literature	
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	Capstone Senior Design Project	3
or ENGR 4996	Honors Capstone Senior Design Project	
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 with Concentration in Electromechanical Engineering

Year 1		
Fall		**Credit Hours**
ENGR 1101 or ENGR 1901	Introduction to Engineering & Engineering Technology or Honors Introduction to Engineering	3
MATH 1041 or MATH 1941	Calculus I or Honors Calculus I	4
CHEM 1035	Chemistry for Engineers	3
CHEM 1033 or CHEM 1953	General Chemistry Laboratory I or Honors Chemical Science Laboratory I	1
ENG 0802 or ENG 0812 or ENG 0902	Analytical Reading and Writing or Analytical Reading and Writing: ESL or Honors Writing About Literature	4
	Credit Hours	**15**
Spring		
MATH 1042 or MATH 1942	Calculus II or Honors Calculus II	4
PHYS 1061 or PHYS 1961	Elementary Classical Physics I or Honors 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	
	Credit Hours	**17**
Year 2		
Fall		
MATH 2043 or MATH 2943	Calculus III or Honors Calculus III	4
PHYS 1062 or PHYS 1962	Elementary Classical Physics II or Honors Elementary Classical Physics II	4
ECE 2332	Principles of Electric Circuits	4
ENGR 2331 or ENGR 2931	Engineering Statics or Honors Engineering Statics	3
IH 0851 or IH 0951	Intellectual Heritage I: The Good Life or Honors Intellectual Heritage I: The Good Life	3
	Credit Hours	**18**
Spring		
MATH 2041 or MATH 2941	Differential Equations I or Honors Differential Equations I	3
ENGR 2332	Engineering Dynamics	3
ENGR 2333 or ENGR 2933	Mechanics of Solids or Honors Mechanics of Solids	3
Business Elective #1		3
IH 0852 or IH 0952	Intellectual Heritage II: The Common Good or Honors Intellectual Heritage II: The Common Good	3
ECE 2333	Principles of Electric Circuits Lab	1
	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 ENGR 2996	Technical Communication or Honors Technical Communication	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	
	Credit Hours	**17**
Spring		
Technical Elective #1		3
ECE 3612 or ECE 3914	Processor Systems or Honors Microprocessor Systems	3
ECE 3613 or ECE 3915	Processor Systems Laboratory or Honors Microprocessor Systems Lab	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	
	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
	Credit Hours	**14**
Spring		
ENGR 4296 or ENGR 4996	Capstone Senior Design Project or Honors Capstone Senior Design Project	3
Technical Elective #3		3
Business Elective #2		3
GenEd Breadth Course		3
Free Elective		2
	Credit Hours	**14**
	Total Credit Hours	**128**

Approved Technical Electives

Code	Title	Credit Hours
ECE 3432	Robotic Control using Robotic Operating System (ROS)	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