Mechanical Engineering BSME with Cooperative Education Program Concentration

Overview

The **Bachelor of Science in Mechanical Engineering** is offered by the Department of Mechanical Engineering. This program provides an excellent educational experience for the students. This experience includes an emphasis on the technical, communication and teamwork skills that graduate engineers need to succeed in both the workplace and society in general. In order to achieve these goals, the department places great importance on teaching, research, scholarship, engineering practice and service to the university community and the Engineering profession. The mechanical engineering program is structured to prepare the graduate for the professional practice of engineering and/or graduate school. The curriculum emphasizes a rigorous treatment of the mathematical and scientific approach to the solution of engineering problems. It provides a coherent set of courses in energy conversion and structures/motion in mechanical systems. The program has design across the curriculum and is capped with an integrated design experience in the form of a senior project.

Mechanical Engineering students may complete an **optional concentration** in Cooperative Education Program (Co-Op).

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.

Campus Location: Main

Program Code: EN-ME-BSME

Accreditation

The Mechanical Engineering (BS) program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and Program Criteria for Mechanical and Similarly Named Engineering Programs. ABET is a non-profit and non-governmental accrediting agency for academic programs in the disciplines of applied science, computing, engineering, and engineering technology recognized by the Council for Higher Education Accreditation (CHEA).

+1 Bachelor to Master's Accelerated Degree Program

High-achieving undergraduates can earn both a bachelor's degree and a master's degree within five years. Students apply for this program in sophomore year, and four graduate-level courses are taken in place of undergraduate requirements during junior and senior years. After the bachelor's degree is earned, one graduate-level course is taken in the summer followed by full-time study in the subsequent Fall and Spring semesters to complete the master's degree study. The following accelerated program is available:

- Bachelor of Science in Mechanical Engineering and Master of Science in Mechanical Engineering

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Learn more about the Bachelor of Science in Mechanical Engineering.

These requirements are for students who matriculated in academic year 2023-2024. 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 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 2041	Differential Equations I	3
or MATH 2941	Honors Differential Equations I	
MEE 3011	Analysis and Computation of Linear Systems in Mechanical Engineering	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
or CHEM 1031	General Chemistry I	
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 Mechanical Engineering Courses		
MEE 1117	Fundamentals of Mechanical Engineering Design	2
MEE 1305	Machine Shop Laboratory	1

MEE 2305	Instrumentation and Data Acquisition Lab	1
MEE 3117	Computer-Aided Mechanical Design	3
MEE 3301	Machine Theory and Design	3
MEE 3305	Materials Laboratory	1
MEE 3506	Fluid Mechanics Laboratory	1
MEE 4177	Design and Realization of a Mechanical System	2
MEE 4572	Heat and Mass Transfer	3
Select one of the following:		4
MEE 4422 & MEE 4405	Mechanical Vibrations and Vibrations Laboratory [1]	
MEE 4571 & MEE 4506	Advanced Thermodynamics and Combustion and Energy Conversion Laboratory [1]	
Mechanical Engineering Technical Electives		9
Required Engineering Courses		
ECE 2112	Electrical Devices & Systems I	3
ECE 2113	Electrical Devices & Systems I Lab	1
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	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 3201	Material Science for Engineers	3
ENGR 3553	Mechanics of Fluids	3
or ENGR 3953	Honors Mechanics of Fluids	
ENGR 3571	Classical and Statistical Thermodynamics	3
ENGR 4296	Capstone Senior Design Project (WI)	3
or ENGR 4996	Honors Capstone Senior Design Project	
Free Elective		6
Required Cooperative Education Courses		
ENGR 2181	Co-Op Work Experience I	3
ENGR 3181	Co-Op Work Experience II	3
Total Credit Hours		**134**

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Students in the **Bachelor of Science in Mechanical Engineering Program** must take either of the following sequences of courses:

- MEE 4422 and MEE 4405
  OR
- MEE 4571 and MEE 4506.

Suggested Academic Plan

Below is the five-year academic plan for the Co-Op program leading to the Bachelor of Science in Mechanical 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 Mechanical Engineering with Concentration in Cooperative Education Program

Suggested Plan for New Students Starting in the 2023-2024 Academic Year

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
MEE 1117	Fundamentals of Mechanical Engineering Design	2
PHYS 1061 or PHYS 1961	Elementary Classical Physics I or Honors Elementary Classical Physics I	4
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	**17**
Spring		
Select one of the following:		3
CHEM 1035	Chemistry for Engineers	
CHEM 1031	General Chemistry I	
CHEM 1033 or CHEM 1953	General Chemistry Laboratory I or Honors Chemical Science Laboratory I	1
MATH 1042 or MATH 1942	Calculus II or Honors Calculus II	4
PHYS 1062 or PHYS 1962	Elementary Classical Physics II or Honors Elementary Classical Physics II	4
ENGR 1102	Introduction to Engineering Problem Solving	3
MEE 1305	Machine Shop Laboratory	1
	Credit Hours	**16**
Year 2		
Fall		
ECE 2112	Electrical Devices & Systems I	3
ECE 2113	Electrical Devices & Systems I Lab	1
MATH 2043 or MATH 2943	Calculus III or Honors Calculus III	4
ENGR 2331 or ENGR 2931	Engineering Statics or Honors Engineering Statics	3
ENGR 2196 or ENGR 2996	Technical Communication or Honors Technical Communication	3
IH 0851 or IH 0951	Intellectual Heritage I: The Good Life or Honors Intellectual Heritage I: The Good Life	3
	Credit Hours	**17**
Spring		
ENGR 2332	Engineering Dynamics	3
MEE 2305	Instrumentation and Data Acquisition Lab	1
MATH 2041 or MATH 2941	Differential Equations I or Honors Differential Equations I	3
ENGR 3571	Classical and Statistical Thermodynamics	3
ENGR 2333 or ENGR 2933	Mechanics of Solids or Honors Mechanics of Solids	3
IH 0852 or IH 0952	Intellectual Heritage II: The Common Good or Honors Intellectual Heritage II: The Common Good	3
	Credit Hours	**16**

Year 3		
Fall		
MEE 3011	Analysis and Computation of Linear Systems in Mechanical Engineering	3
MEE 3301	Machine Theory and Design	3
MEE 3305	Materials Laboratory	1
ENGR 3001	Engineering Economics	3
ENGR 3201	Material Science for Engineers	3
GenEd Breadth Course		3
	Credit Hours	**16**
Spring		
ENGR 3553 or ENGR 3953	Mechanics of Fluids or Honors Mechanics of Fluids	3
MEE 3117	Computer-Aided Mechanical Design	3
MEE 3506	Fluid Mechanics Laboratory	1
Mechanical Engineering Technical Elective #1		3
Mechanical Engineering Technical Elective #2		3
GenEd Breadth Course		3
	Credit Hours	**16**
Year 4		
Fall		
ENGR 2181	Co-Op Work Experience I	3
	Credit Hours	**3**
Spring		
ENGR 3181	Co-Op Work Experience II	3
	Credit Hours	**3**
Year 5		
Fall		
MEE 4177	Design and Realization of a Mechanical System	2
MEE 4572	Heat and Mass Transfer	3
Select one of the following: [1]		4
MEE 4422 & MEE 4405	Mechanical Vibrations and Vibrations Laboratory	
MEE 4571 & MEE 4506	Advanced Thermodynamics and Combustion and Energy Conversion Laboratory	
GenEd Breadth Course		3
Free Elective		3
	Credit Hours	**15**
Spring		
ENGR 4296 or ENGR 4996	Capstone Senior Design Project or Honors Capstone Senior Design Project	3
Mechanical Engineering Technical Elective #3		3
GenEd Breadth Course		3
GenEd Breadth Course		3
Free Elective		3
	Credit Hours	**15**
	Total Credit Hours	**134**

Approved Technical Electives

Code	Title	Credit Hours
BIOE 3719	Introduction to Bioengineering	3
BIOE 3725	Cell Biology for Engineers	3
BIOE 4741	Biomaterials for Engineers	3

CEE 3048	Probability, Statistics & Stochastic Methods	3
CEE 3711	Environmental Engineering	3
ECE 3822	Engineering Computation II (Note: permission of instructor required)	3
ENGR 4116	Spacecraft Systems Engineering	3
ENGR 4121	Design of Experiments	3
ENGR 4201	Micro- to Nano-sized Machines	3
ENGR 4314	Continuum Mechanics	3
ENGR 4576	Computational Fluid Dynamics	3
MEE 3185	Mechanical Engineering Summer Work Experience	3
MEE 3302	Kinematics of Mechanisms	3
MEE 3421	Dynamic Systems	3
MEE 3422	Modeling and Control of Electromechanical Systems	3
MEE 4040	Special Topics	1-4
MEE 4172	High-Speed Imaging and Analysis for Engineering Applications	3
MEE 4173	Data Acquisition and Analysis for Engineers	3
MEE 4212	Tribology and Surface Engineering	3
MEE 4311	Mechanics of Composite Materials	3
MEE 4314	Impact and Crashworthiness	3
MEE 4411	Introduction to Mobile Robotics (Note: MEE 4412 is prerequisite)	3
MEE 4412	Modern Dynamics for Robotics	3
MEE 4413	Robotic Manipulation (Note: MEE 4412 is prerequisite)	3
MEE 4414	Optimization and Control of Mechanical Systems (Note: MEE 3422 is prerequisite)	3
MEE 4422 & MEE 4405	Mechanical Vibrations and Vibrations Laboratory	4
MEE 4512	Compressible Fluid Dynamics	3
MEE 4513	Aerodynamics	3
MEE 4571 & MEE 4506	Advanced Thermodynamics and Combustion and Energy Conversion Laboratory	4
MEE 4574	Heating, Ventilating, and Air Conditioning	3
MEE 4575	Renewable and Alternative Energy	3
MEE 4577	Power Generation and Storage Technologies	3
MEE 4578	Fundamentals of Combustion	3
MEE 4643	Manufacturing Engineering	3
MEE 4731	Cardiovascular Fluid Dynamics	3