

# Bachelor of Science in Mechanical Engineering with Co-op

Learn more about the Bachelor of Science in Mechanical 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 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

### Department Requirements

Code	Title	Credit Hours
<b>Required Math &amp; Basic Science Courses</b>		
MATH 1041 or MATH 1941	Calculus I Honors Calculus I	4
MATH 1042 or MATH 1942	Calculus II Honors Calculus II	4
MATH 2043 or MATH 2943	Calculus III Honors Calculus III	4
MATH 2041 or MATH 2941	Differential Equations I Honors Differential Equations I	3
MEE 3011	Analysis and Computation of Linear Systems in Mechanical Engineering	3
PHYS 1061 or PHYS 1961	Elementary Classical Physics I Honors Elementary Classical Physics I	4
PHYS 1062 or PHYS 1962	Elementary Classical Physics II Honors Elementary Classical Physics II	4
CHEM 1035 or CHEM 1031	Chemistry for Engineers General Chemistry I	3
CHEM 1033 or CHEM 1953	General Chemistry Laboratory I Honors Chemical Science Laboratory I	1
<b>Required General Education Courses</b>		
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 or IH 0951	Intellectual Heritage I: The Good Life Honors Intellectual Heritage I: The Good Life	3
IH 0852 or IH 0952	Intellectual Heritage II: The Common Good Honors Intellectual Heritage II: The Common Good	3
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
<b>Required Mechanical Engineering Courses</b>		
MEE 1117	Fundamentals of Mechanical Engineering Design	2
MEE 2305	Instrumentation and Data Acquisition Lab	1
MEE 3117	Computer-Aided Mechanical Design	3
MEE 3301	Machine Theory and Design	3
MEE 3304	Mechanical Design and Fabrication	3
MEE 3305	Materials Laboratory	1
MEE 3506	Fluid Mechanics Laboratory	1
MEE 4572	Heat and Mass Transfer	3
Select one of the following:		4
MEE 4422 & MEE 4405	Mechanical Vibrations and Vibrations Laboratory <sup>1</sup>	
MEE 4571 & MEE 4506	Advanced Thermodynamics and Combustion and Energy Conversion Laboratory <sup>1</sup>	
Mechanical Engineering Technical Electives		9
<b>Required Engineering Courses</b>		
ECE 2112	Electrical Devices & Systems I	3
ECE 2113	Electrical Devices & Systems I Lab	1
ENGR 1101 or ENGR 1901	Introduction to Engineering & Engineering Technology Honors Introduction to Engineering	3
ENGR 1102	Introduction to Engineering Problem Solving	3
ENGR 2196 or ENGR 2996	Technical Communication Honors Technical Communication	3
ENGR 2331 or ENGR 2931	Engineering Statics Honors Engineering Statics	3
ENGR 2332	Engineering Dynamics	3
ENGR 2333 or ENGR 2933	Mechanics of Solids Honors Mechanics of Solids	3
ENGR 3001	Engineering Economics	3
ENGR 3201	Material Science for Engineers	3
ENGR 3553 or ENGR 3953	Mechanics of Fluids Honors Mechanics of Fluids	3
ENGR 3571	Classical and Statistical Thermodynamics	3
ENGR 4296 or ENGR 4996	Senior Design Project II (WI) Honors Senior Design Project II	3
Free Elective		6
<b>Required Cooperative Education Courses</b>		
ENGR 2181	Co-Op Work Experience I	3
ENGR 3181	Co-Op Work Experience II	3

**Total Credit Hours****134**

- <sup>1</sup> 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 Cooperative Education

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

Year 1		Credit Hours
<b>Fall</b>		
ENGR 1101 or 1901	Introduction to Engineering & Engineering Technology	3
MATH 1041 or 1941	Calculus I	4
MEE 1117	Fundamentals of Mechanical Engineering Design	2
PHYS 1061 or 1961	Elementary Classical Physics I	4
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW]	4
<b>Term Credit Hours</b>		<b>17</b>
<b>Spring</b>		
Select one of the following:		3
CHEM 1035	Chemistry for Engineers	
CHEM 1031	General Chemistry I	
CHEM 1033 or 1953	General Chemistry Laboratory I	1
MATH 1042 or 1942	Calculus II	4
PHYS 1062 or 1962	Elementary Classical Physics II	4
ENGR 1102	Introduction to Engineering Problem Solving	3
<b>Term Credit Hours</b>		<b>15</b>
<b>Year 2</b>		
<b>Fall</b>		
ECE 2112	Electrical Devices & Systems I	3
ECE 2113	Electrical Devices & Systems I Lab	1
MATH 2043 or 2943	Calculus III	4
ENGR 2331 or 2931	Engineering Statics	3
ENGR 2196 or 2996	Technical Communication [WI]	3
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY]	3
<b>Term Credit Hours</b>		<b>17</b>
<b>Spring</b>		
ENGR 2332	Engineering Dynamics	3
MEE 2305	Instrumentation and Data Acquisition Lab	1
MATH 2041 or 2941	Differential Equations I	3
ENGR 3571	Classical and Statistical Thermodynamics	3
ENGR 2333 or 2933	Mechanics of Solids	3
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
<b>Term Credit Hours</b>		<b>16</b>
<b>Year 3</b>		
<b>Fall</b>		
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
<b>Term Credit Hours</b>		<b>16</b>
<b>Spring</b>		
ENGR 3553 or 3953	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
<b>Term Credit Hours</b>		<b>16</b>
<b>Year 4</b>		
<b>Fall</b>		
ENGR 2181	Co-Op Work Experience I	3
<b>Term Credit Hours</b>		<b>3</b>
<b>Spring</b>		
ENGR 3181	Co-Op Work Experience II	3
<b>Term Credit Hours</b>		<b>3</b>
<b>Year 5</b>		
<b>Fall</b>		
MEE 3304	Mechanical Design and Fabrication	3
MEE 4572	Heat and Mass Transfer	3
Select one of the following: <sup>1</sup>		4
MEE 4422 & MEE 4405	Mechanical Vibrations	
MEE 4571 & MEE 4506	Advanced Thermodynamics and Combustion	
GenEd Breadth Course		3
Free Elective		3
<b>Term Credit Hours</b>		<b>16</b>
<b>Spring</b>		
ENGR 4296 or 4996	Senior Design Project II [WI]	3
Mechanical Engineering Technical Elective #3		3
GenEd Breadth Course		3
GenEd Breadth Course		3
Free Elective		3
<b>Term Credit Hours</b>		<b>15</b>
<b>Total Credit Hours:</b>		<b>134</b>

### 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