

# Bachelor of Science in Mechanical Engineering with Co-op

Learn more about the Bachelor of Science in Mechanical Engineering (<https://www.temple.edu/academics/degree-programs/mechanical-engineering-major-en-me-bsme>).

## 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 (<http://bulletin.temple.edu/undergraduate/general-education>)) 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 by Design	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 3041 or MATH 3941	Differential Equations I Honors Differential Equations I	3
MEE 2011	Linear Systems	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	Chemistry for Engineers	3
CHEM 1033 or CHEM 1953	General Chemistry Laboratory I Honors Chemical Science Laboratory I	1
ENGR 3201	Material Science for Engineers	3
<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	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
<b>Required Mechanical Engineering Courses</b>		
MEE 2305	Instrumentation and Data Acquisition Lab	1
MEE 3301	Machine Theory and Design	3
MEE 3305	Materials Laboratory	1
MEE 3421	Dynamic Systems	3
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		6
<b>Required Engineering Courses</b>		
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 1117	Engineering Graphics	2
ENGR 2196	Technical Communication	3
or ENGR 2996	Honors Technical Communication by Design	
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 3117	Computer-Aided Design (CAD)	3
ENGR 3553	Mechanics of Fluids	3
or ENGR 3953	Honors Mechanics of Fluids	
ENGR 3571	Classical and Statistical Thermodynamics	3
ENGR 4169	Engineering Seminar	1
ENGR 4177	Senior Design Project I for Mechanical Engineering	2
ENGR 4296	Senior Design Project II (WI)	3
or ENGR 4996	Honors Senior Design Project II	
Free Elective <sup>2</sup>		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 (technical elective; offered every Fall semester) and MEE 4405 (lab elective)
- OR**
- MEE 4571 (technical elective; offered every Spring semester) and MEE 4506 (lab elective).

- <sup>2</sup> ENGR 3033 is highly recommended as the free elective. ENGR 3033 is offered every semester.

## 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 2018-2019 Academic Year

Year 1		Credit Hours
<b>Fall</b>		
ENGR 1101 or 1901	Introduction to Engineering Engineering Technology	3
ENGR 1117	Engineering Graphics	2
MATH 1041 or 1941	Calculus I	4
PHYS 1061 or 1961	Elementary Classical Physics I	4
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW]	4
Term Credit Hours		17
<b>Spring</b>		
CHEM 1035	Chemistry for Engineers	3
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
Term Credit Hours		15
<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
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY]	3
ENGR 2196 or 2996	Technical Communication [WI]	3
Term Credit Hours		17
<b>Spring</b>		
ENGR 2332	Engineering Dynamics	3
MEE 2305	Instrumentation and Data Acquisition Lab	1
MATH 3041 or 3941	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
Term Credit Hours		16
<b>Year 3</b>		
<b>Fall</b>		
ENGR 3553 or 3953	Mechanics of Fluids	3
MEE 3506	Fluid Mechanics Laboratory	1
MEE 2011	Linear Systems	3
ENGR 3001	Engineering Economics	3
MEE 3301	Machine Theory and Design	3

GenEd Breadth Course		3
	Term Credit Hours	16
<b>Spring</b>		
ENGR 3201	Material Science for Engineers	3
MEE 3305	Materials Laboratory	1
ENGR 3117	Computer-Aided Design (CAD)	3
MEE 3421	Dynamic Systems	3
ENGR 4169	Engineering Seminar	1
Mechanical Engineering Technical Elective #1		3
GenEd Breadth Course		3
	Term Credit Hours	17
<b>Year 4</b>		
<b>Fall</b>		
ENGR 2181	Co-Op Work Experience I	3
	Term Credit Hours	3
<b>Spring</b>		
ENGR 3181	Co-Op Work Experience II	3
	Term Credit Hours	3
<b>Year 5</b>		
<b>Fall</b>		
ENGR 4177	Senior Design Project I for Mechanical Engineering	2
MEE 4572	Heat and Mass Transfer	3
Select one of the following: <sup>1</sup>		4
MEE 4422	Mechanical Vibrations	
& MEE 4405		
OR Mechanical Engineering Technical Elective #2		
GenEd Breadth Course		3
Free Elective <sup>2</sup>		3
	Term Credit Hours	15
<b>Spring</b>		
ENGR 4296 or 4996	Senior Design Project II [WI]	3
Select one of the following: <sup>1</sup>		4
MEE 4571	Advanced Thermodynamics and Combustion	
& MEE 4506		
OR Mechanical Engineering Technical Elective #3		
Free Elective <sup>2</sup>		2
GenEd Breadth Course		3
GenEd Breadth Course		3
	Term Credit Hours	15
	Total Credit Hours:	134

<sup>1</sup> Either MEE 4422 & MEE 4405 (in Fall) OR MEE 4571 & MEE 4506 (in Spring) are required in the Mechanical Engineering Program. When the choice is made, one credit of free elective replaces the lab in the other term.

<sup>2</sup> ENGR 3033 is highly recommended as the free elective. ENGR 3033 is offered every semester.

## 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
BIOL 3334	Mammalian Physiology	4
CEE 3711	Environmental Engineering	3

ENGR 4116	Spacecraft Systems Engineering	3
ENGR 4314	Continuum Mechanics	3
ENGR 4334	Advanced Dynamical Systems	3
ENGR 4576	Computational Fluid Dynamics	3
ENGR 4577	Nanotechnology Solutions for a Sustainable Urban Environment	3
MEE 3302	Kinematics of Mechanisms	3
MEE 4173	Data Acquisition and Analysis for Engineers	3
MEE 4311	Mechanics of Composite Materials	3
MEE 4312		3
MEE 4313		3
MEE 4411	Introduction to Mobile Robotics	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 4576	Photovoltaic System Design for Engineers	3
MEE 4577	Power Generation and Storage Technologies	3
MEE 4731	Cardiovascular Fluid Dynamics	3
MEE 4734		3