

MECHANICAL ENGINEERING AND APPLIED MECHANICS, BSE

Mechanical Engineering & Applied Mechanics is the study of forces, deformation, and motions of solid bodies and fluids (liquids and air), heat & energy generation and transport. Mechanical engineers are equipped with knowledge to design and develop everything you think of as a device, mechanism, or machine, including wind turbines, rocket engines, robots, 3D printers, micro-engines, nanomotors, and more. We assure safety in systems people use day to day, from transportation to appliances to medical devices.

For more information: <https://www.seas.upenn.edu/prospective-students/undergrad/majors/mechanical-engineering-and-applied-mechanics/>

Mechanical Engineering and Applied Mechanics (MEAM) Major Requirements

37 course units are required.

Code	Title	Course Units
MEAM Core		
MEAM 2020	Introduction to Thermal-Fluids Engineering	1
MEAM 2030	Thermodynamics I	1
MEAM 2100	Statics and Strength of Materials	1
MEAM 2110	Engineering Mechanics: Dynamics	1
MEAM 2470	Mechanical Engineering Laboratory I	0.5
MEAM 2480	Mechanical Engineering Lab I	0.5
MEAM 3470	Mechanical Engineering Design Laboratory	1
MEAM 3480	Mechanical Engineering Design Laboratory	1
MEAM 4450	Mechanical Engineering Design Projects	1
MEAM 4460	Mechanical Engineering Design Projects	1
Concentration		
Select only one track from the options below in the Concentration area. You must formally declare a concentration by submitting the MEAM Concentration form. Students who do not declare a concentration will default into the General Concentration.		4
Math and Natural Science		
MATH 1400	Calculus, Part I	1
MATH 1410	Calculus, Part II	1
MATH 2400	Calculus, Part III	1
ENM 2510	Analytical Methods for Engineering	1
or MATH 2410	Calculus, Part IV	
MEAM 1100 & MEAM 1470	Introduction to Mechanics and Introduction to Mechanics Lab	1.5
or PHYS 0150	Principles of Physics I: Mechanics and Wave Motion	
PHYS 0151	Principles of Physics II: Electromagnetism and Radiation	1.5
or ESE 1120	Engineering Electromagnetics	
CHEM 1011	Introduction to General Chemistry I	1

or BIOL 1121	Introduction to Biology - The Molecular Biology of Life	
Math Elective		1
Math or Natural Science Elective		1
Professional Electives ¹		
ENGR 1050	Introduction to Scientific Computing	1
or CIS 1100	Introduction to Computer Programming	
or CIS 1200	Programming Languages and Techniques I	
MEAM Upper Level		2
Technical Elective		4
General Electives ⁴		
EAS 2030	Engineering Ethics	1
Select 1 Social Science course		1
Select 2 Humanities courses		2
Select 1 Social Science or Humanities course		1
Select 2 Social Science or Humanities or Technology in Business & Society courses		2
Total Course Units		37

¹ Maximum of three 1000-level courses permitted.

² MEAM Upper Level courses include all MEAM 5000-level courses except MEAM 5990

³ Technical Electives include courses from the Math, Science and Engineering categories. One Technical Elective may be satisfied with advanced dual degree requirements (with approval). If following the General Concentration, one of these Technical Electives should be at the 5000-level, resulting in a total of three MEAM Upper Level courses and three Technical Electives.

⁴ Must include a Writing Seminar (a list of approved Writing Seminars can be found in the SEAS Undergraduate Handbook (<https://ugrad.seas.upenn.edu/student-handbook/courses-requirements/writing-courses/>))

Concentrations

An approved list of MEAM Upper Level courses for each concentration can be found in the MEAM Undergraduate Handbook.

Code	Title	Course Units
Dynamics, Controls, and Robotics Concentration		
MEAM 3200	Intro to Mechanical and Mechatronic Systems	
MEAM 3210	Dynamic Systems and Control	
MEAM 3000-level breadth elective		
MEAM Upper Level		
Code	Title	Course Units
Energy, Fluids and Thermal Systems Concentration		
MEAM 3020	Fluid Mechanics	
MEAM 3330	Heat and Mass Transfer	
MEAM 3000-level breadth elective		
MEAM Upper Level		

Code	Title	Course Units
General Concentration		
MEAM 3020	Fluid Mechanics	
MEAM 3210	Dynamic Systems and Control	
MEAM 3330	Heat and Mass Transfer	
MEAM 3540	Mechanics of Solids	

Code	Title	Course Units
Mechanics of Materials, Structures and Design Concentration		
MEAM 3210	Dynamic Systems and Control	
MEAM 3540	Mechanics of Solids	
MEAM 3000-level breadth elective		
MEAM Upper Level		

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2023 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.
