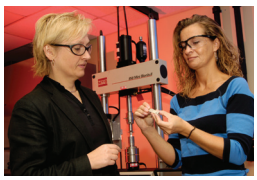
University of Delaware | Mechanical Engineering



WHAT IS MECHANICAL ENGINEERING?

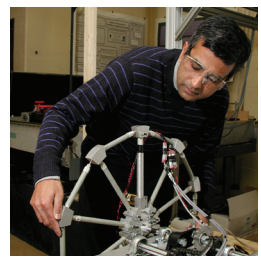
Mechanical engineering is one of the most interesting, satisfying, and exciting careers in our increasingly technological society. But because mechanical engineering is so diverse, there isn't a very concise description of the field. A degree in mechanical engineering opens the door for careers in a wide variety of areas, including the following:

- **BIOMECHANICS:** The body is a mechanical system containing fluid flow and structural and dynamical components. Mechanical engineers are leaders in the solution of biomedical problems.
- **AIR AND FLUID FLOW:** Mechanical engineers apply the physics of gases and fluids to design devices like air conditioners, heating systems, respirators, engine cooling systems, aircraft, and spacecraft.
- **COMPOSITE MATERIALS:** Composite structures have become the standard for high-performance sporting goods and aerospace vehicles, and mechanical engineers are leading the development of more and better applications for these advanced materials.
- **DESIGN:** Engineering design makes extensive use of science but is concerned with creating new things—turning ideas into reality.
- **THE ENVIRONMENT:** Mechanical engineering fundamentals are used to understand atmospheric transport and transformation of pollutants, their thermodynamic and chemical properties, and particle dynamics.
- **MANUFACTURING AND PROCESSING:** Modern manufacturing employs machines that mechanical engineers design and build.
- **SMART MATERIALS AND CONTROLS:** Mechanical engineers exploit new engineering materials to develop novel sensors and actuators and to provide detection and control for vibration suppression.
- **FAILURE:** Mechanical engineers must anticipate how things fail in order to design them in the most efficient way.

MAJOR AREAS OF EMPHASIS

Students working on the Bachelor of Mechanical Engineering degree have some flexibility in designing a curriculum to meet their needs and interests. You may choose a formal concentration in aerospace engineering or a minor in biomedical engineering, or you can create your own combination of technical electives with the help of your faculty advisor.

Because mechanical engineers have such broad exposure to design, technology, and its development, they are often drawn into business, financial, or legal aspects of technology. With a degree in mechanical engineering, you can work also in one of the many traditional jobs in industry, from aerospace, air pollution, automotive, and air conditioning to bioengineering, chemicals, composites, controls, and design.



Active research ensures that the content of the undergraduate program is constantly renewed and maintained at a challenging technical level and integrates discovery learning into the program. Opportunities abound for mechanical engineering undergraduates to work with faculty and graduate students as research assistants, either for pay or independent study credit. We want our graduates to have the skills necessary to pursue advanced degrees.

Research in the department covers a broad range of topics including fluid mechanics, materials, nonlinear dynamics, and solid mechanics. In addition to these general areas of research, the department has six focused areas of research: biomechanics, composites and materials, environmental and biological fluid mechanics, robotics and controls, manufacturing sciences, and clean energy. More detailed information about our research program is available on our website.

ADDITIONAL OPPORTUNITIES FOR STUDY

EXPLORING THE HUMANITIES AND SOCIAL SCIENCES THROUGH THE BREADTH REQUIREMENTS

All engineering curricula have at least 18 credits set aside for breadth requirement courses, which are chosen from an extensive list of humanities and social science options. To provide both breadth and depth, students are required to complete courses from both categories, with at least two of the courses being above the introductory level. Students entering with Advanced Placement (AP) credits may already have completed several of these courses.

EXPLORING OTHER SUBJECTS THROUGH MINORS

A minor is a small set of courses in a particular subject area that is different from a student's major. Minors normally require five to seven courses to be completed in their subject areas. Because students may double-count courses for credit against both majors and minors, they can often complete a minor by doing no additional work if they choose their elective courses carefully. About half of all engineering students have at least one minor, and many have two or three. Some of the most popular minors for mechanical engineering majors include biology, biomedical engineering, chemistry, economics, environmental engineering, foreign languages, materials science, mathematics, nanoscale materials, physics, and sustainable energy technology.

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AFTER GRADUATION

The study of engineering fosters the development of quantitative, analytical, and problem-solving skills that are very useful in many different career areas. On average, 70–80% of graduates with a Bachelor of Mechanical Engineering degree choose employment in private industry, government laboratories and agencies, and non-profit research centers. Approximately 15–25% of mechanical engineering graduates will choose to continue their education toward a master's or Ph.D. degree, and some graduates will choose to attend medical, law, architecture, or business school. Students who earn Ph.D. degrees in engineering usually pursue a career in advanced research or as a faculty member in a college of engineering.

MECHANICAL ENGINEERING CURRICULUM

FALL

FIRST YEAR

COURSE #	COURSE DESCRIPTION	CREDITS
EGGG 101	Introduction to Engineering (FYE)	2
CHEM 103	General Chemistry	4
MATH 241	Analytic Geometry & Calculus A	4
CISC 106	General Computer Science for Engineers	3
ENGL 110	Critical Reading and Writing	3
		16

SECOND YEAR

MEEG 211	Dynamics	3
MEEG 215	Mechanics of Solids	4
MATH 243	Analytic Geometry & Calculus C	4
MATH 351	Engineering Mathematics I	3
	Breadth Requirement Elective 2	3
		17

THIRD YEAR

MEEG 301	Machine Design-Kinematics and Kinetics	3
MEEG 311	Vibration and Control	4
MEEG 321	Materials Engineering	3
MEEG 331	Fluid Mechanics I	4
MEEG 341	Thermodynamics	3
		17

FOURTH YEAR

MEEG 401	Senior Design (DLE)	6
	Technical Elective I	3
	Technical Elective 2	3
	Breadth Requirement Elective 4	3
		15

SPRING

FIRST YEAR

COURSE #	COURSE DESCRIPTION	CREDITS
MEEG 112	Statics	3
PHYS 207	Fundamentals of Physics I	4
MATH 242	Analytic Geometry & Calculus B	4
	Breadth Requirement Elective 1*	3
		14

SECOND YEAR

MEEG 202	Computer-Aided Engineering Design	3
MSEG 302	Materials Science for Engineers	3
MATH 352	Engineering Mathematics II	3
MATH 353	Engineering Mathematics III	3
PHYS 245	Introduction to Electricity and Electronics	4
		16

THIRD YEAR

MEEG 304	Machine Design-Elements	3
MEEG 332	Fluid Mechanics II	3
MEEG 342	Heat Transfer	3
MEEG 346	Thermal Lab	1
	Basic Science Elective	3
	Breadth Requirement Elective 3	3
		16

FOURTH YEAR

	Technical Elective 3	3
	Technical Elective 4	3
	Breadth Requirement Elective 5	3
	Breadth Requirement Elective 6	3
		12

TOTAL CREDIT HOURS 123

** A list of Breadth Requirement courses is available at: www.engr.udel.edu/advise/undergrad_programs.html*