

Mechanical Engineering (BSME)

Bachelor of Science in Mechanical Engineering

Mechanical engineering is one of the largest and broadest fields of technical study. Mechanical engineers are concerned with the engineering systems used to control and transform energy to meet the needs of humanity. In mechanical engineering, students develop an understanding of basic topics and fundamental principles upon which engineered systems are conceived and developed in a modern society. It is an excellent foundation for a rewarding career in engineering, as well as for further study in business, law, medicine, and other professions that require a solid foundation in science and technology, and the ability to solve problems.

The mechanical engineering department is dedicated to graduating mechanical engineers who practice mechanical engineering in the general stems of thermal/fluid systems, mechanical systems and design, and materials and manufacturing in industry and government settings; pursue advanced education, research and development, and other creative efforts in science and technology; conduct themselves in a responsible, professional, and ethical manner; and participate as leaders in activities that support service to and economic development of the region, state, and nation.

The mechanical engineering faculty has defined seven educational outcomes that students in the program are expected to achieve by the time of graduation. These outcomes are

- Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- Ability to communicate effectively with a range of audiences
- Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The mechanical engineering curriculum meets these outcomes by providing breadth and depth across a range of topics.

- A combination of college-level mathematics and basic science courses (some with experimental work) that includes mathematics, probability and statistics, physics, and chemistry
- Engineering courses that develop a working knowledge of graphics and computer-aided design, engineering mechanics, thermodynamics, kinematics, dynamics and control of mechanical systems, computational methods, fluid mechanics, heat transfer,

materials science and engineering, mechatronics, technical communication, and engineering economics

- Mechanical engineering project and laboratory experiences that develop competence in measurements and instrumentation, interpretation of data, reverse engineering analysis of mechanical systems, use of computational tools for engineering analysis, integration of multidisciplinary topics in design of complex systems, teamwork and project planning, and written and oral communication
- A sequence of engineering design courses, culminating in a major capstone design experience in collaboration with an industrial sponsor, that draws on the knowledge and skills students have acquired in earlier coursework and incorporates modern engineering standards and realistic constraints
- Core curriculum courses, including social and behavioral sciences, humanities, and visual and performing arts electives, that complement the technical content of the curriculum
- A broad range of senior elective options that provide a career gateway to further study and lifelong learning in the practice of engineering and other professions
- Many courses throughout the curriculum are structured to motivate the study of engineering science by challenging students with in-depth analysis of real mechanical components and systems. In these courses, students address real-world projects based on current industrial methods and practices to connect theory with practice.

Portable Computing Devices

Students entering Mechanical Engineering are expected to have a laptop computer at their disposal. The use of laptop computers will be necessary in many required courses, and individual instructors may require that a laptop be brought to class or lab sessions. For a list of minimum system requirements see: <https://www.me.utexas.edu/academics/undergraduate-program/laptop-requirements>.

Total Hours Required: 126

Plan of Study

The Plan of Study is a suggested four-year course sequence to support academic planning and serves as a helpful guide. Currently enrolled students should meet with their academic advisor to tailor their course selections and timelines to their individual goals and circumstances.

Course	Title	Hours
Year 1		
Semester 1		
CH 301	Principles of Chemistry I	3
M 408C	Differential and Integral Calculus	4
M E 302	Introduction to Engineering Design and Graphics	3
RHE 306	Rhetoric and Writing	3
First-Year Signature Course (090)		3
Hours		16
Semester 2		
M 408D	Sequences, Series, and Multivariable Calculus	4
PHY X03K & PHY X05M	Engineering Physics I and Laboratory For Physics 302K, 303K, and 317K	4
Social and Behavioral Sciences		3
Visual and Performing Arts (050)		3
U.S. History (060)		3
Hours		17
Year 2		
Semester 1		
E M 306	Statics	3
M 427J	Differential Equations with Linear Algebra	4
M E 316T	Thermodynamics	3

PHY X03L & PHY X05N	Engineering Physics II and Laboratory For Physics 302L, 303L, and 317L	4
<u>American and Texas Government (070)</u>		3
Hours		17
Semester 2		
E M 319	Mechanics of Solids	3
M 427L	Advanced Calculus for Applications II	4
M E 318M	Programming and Engineering Computational Methods	3
M E 314D	Dynamics	3
E S 333T	Engineering Communication	3
Hours		16
Year 3		
Semester 1		
M E 330	Fluid Mechanics	3
M E 130L	Experimental Fluid Mechanics	1
M E 334	Materials Engineering	3
M E 134L	Materials Engineering Laboratory	1
M E 335	Engineering Statistics	3
Hours chosen from: Career Gateway Elective		3
Hours		14
Semester 2		
M E 338	Machine Elements	3
M E 339	Heat Transfer	3
M E 139L	Experimental Heat Transfer	1
M E 340	Mechatronics	3
M E 140L	Mechatronics Laboratory	1
Hours chosen from: Career Gateway Elective		3
Hours		14
Year 4		
Semester 1		
M E 344	Dynamic Systems and Controls	3
M E 144L	Dynamic Systems and Controls Laboratory	1
M E 353	Engineering Finance	3
M E 366J	Mechanical Engineering Design Methodology	3
Hours chosen from: Career Gateway Elective		3
<u>American and Texas Government (070)</u>		3
Hours		16
Semester 2		
M E 466E	Mechanical Engineering Capstone Design	4
Hours chosen from: Career Gateway Elective		3
Hours chosen from: Approved Mathematics/Natural Science Elective		3
<u>Humanities (040)</u>		3
<u>U.S. History (060)</u>		3
Hours		16
Total Hours		126

Requirements

All requirements are listed below, starting with the most specialized moving to the most general. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy [General Education](#) requirements, including [Core Curriculum](#).

Degree-Bachelor of Science in Mechanical Engineering (BSME)

Code	Title	Hours
Degree		
M E 130L	Experimental Fluid Mechanics	1
M E 134L	Materials Engineering Laboratory	1
M E 139L	Experimental Heat Transfer	1
M E 140L	Mechatronics Laboratory	1

M E 144L	Dynamic Systems and Controls Laboratory	1
M E 466E	Mechanical Engineering Capstone Design	4
M E 302	Introduction to Engineering Design and Graphics	3
M E 314D	Dynamics	3
M E 316T	Thermodynamics	3
M E 318M	Programming and Engineering Computational Methods	3
M E 330	Fluid Mechanics	3
M E 334	Materials Engineering	3
M E 335	Engineering Statistics	3
M E 338	Machine Elements	3
M E 339	Heat Transfer	3
M E 340	Mechatronics	3
M E 344	Dynamic Systems and Controls	3
M E 353	Engineering Finance	3
M E 366J	Mechanical Engineering Design Methodology	3
CH 301	Principles of Chemistry I	3
E M 306	Statics	3
E M 319	Mechanics of Solids	3
M 408C	Differential and Integral Calculus	4
M 408D	Sequences, Series, and Multivariable Calculus	4
M 427J	Differential Equations with Linear Algebra	4
M 427L	Advanced Calculus for Applications II	4
PHY 303K	Engineering Physics I	3
PHY 303L	Engineering Physics II	3
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
RHE 306	Rhetoric and Writing	3
E S 333T	Engineering Communication	3
Approved career gateway electives		12
Approved natural science/mathematics elective		3
Free electives: Additional coursework to reach total hours required.		0
<i>Subtotal</i>		<i>102</i>
General Education		
<u>Remaining Core Curriculum (42 hours total)</u>		24
<u>Foreign Language other than English, Beginning Proficiency</u>		
Subtotal		
<u>College Requirements - Engineering</u>		
<u>General University Requirements</u>		
Total Hours		126

Additional Requirements and Policies

Career Gateway Elective Options

The ME curriculum includes 12 credit hours of Career Gateway Electives (CGEs) which give students the flexibility to tailor their upper-division academic program to meet a variety of career goals, while ensuring that they graduate with a robust grounding in one or more selected technical or specialty areas. The CGEs are arranged into tracks, each of which has designated courses. Technical tracks are designed to provide more focus in a selected technical area than is provided in the core curriculum alone. Specialty tracks are designed for those students whose career interests extend beyond mechanical engineering. Detailed guidelines for choosing CGEs and for approval of CGE choices are published on the mechanical engineering website and may be subject to periodic change as needs arise. Exceptions can be considered on a case-by-case basis by petition to the undergraduate advisor.

Minors and Transcript-Recognized Certificate Programs

Minors and transcript-recognized certificate programs offer interdisciplinary curricula that support and extend a student's major. Minors that may be of particular interest to mechanical engineering students include the minor in Materials Science and Engineering and certificates in Computational Science and Engineering, the National Academy of Engineering Grand Challenges Scholars Program, Humanitarian Engineering, Applied Statistical Modeling, and Pre-Health Professions. Additional information about minors and transcript recognized certificates is available [online](#).