

*\*See the University Core Curriculum section of this catalog for approved list of course options.*

*\*\* See College of Engineering degree requirements section of this catalog for approved list of course options.*

*Actual degree plans may vary depending on availability of courses in a given semester.*

*Some courses may require prerequisites not listed.*

## Minor

The minor in materials science and engineering requires a total of 18 semester credit hours: 15 hours of materials science and engineering courses, plus ENGR 3450, Engineering Materials. At least 6 of the 15 hours in materials science and engineering should be from any two of the four core courses: MTSE 3010, MTSE 3030, MTSE 3050 and MTSE 3070. The remaining 9 hours can be from any other 3000- or 4000-level materials science engineering courses.

**Note:** The prerequisite of MFET 2100 for ENGR 3450 is waived for students registering for a minor in materials science and engineering; however, the other prerequisites for ENGR 3450 (CHEM 1410/1430 and MATH 1710) must be completed by students registering for the minor in materials sciences and engineering.

## Courses of Instruction

All Courses of Instruction are located in one section at the back of this catalog.

### Course and Subject Guide

The "Course and Subject Guide," found in the Courses of Instruction section of this book, serves as a table of contents and provides quick access to subject areas and prefixes.

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# Department of Mechanical and Energy Engineering

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**Miguel Acevedo, Interim Chair**

## Faculty

Boetcher, Choi, Feng, Plummer, Prasad, Traum

## Introduction

The Department of Mechanical and Energy Engineering at the University of North Texas is committed to academic excellence in undergraduate and graduate education and research in all areas pertinent to the discipline of mechanical engineering and in particular to thermal-fluid sciences, energy production, and solid mechanics. The goals of the Department and its faculty are: (1) to provide high quality and innovative educational programs at the undergraduate and graduate levels; (2) to foster lifelong learning by promoting professionalism and ethical standards and helping students develop leadership qualities; (3) to pursue excellence in scholarly research in areas of mechanical and energy engineering; and (4) to collaborate with engineers in industry, national laboratories, and government agencies in finding the solutions to national and global problems related to energy use and its environmental impacts.

## Mission and Vision

The mission of the Department of Mechanical and Energy Engineering is to harness the power of ideas by providing a student-centered environment, fostering a strong culture of learning, promoting high quality scholarly activities, serving the engineering profession and society, and advancing regional economic development. We seek to accomplish this mission by:

- Offering high quality and innovative educational programs at the undergraduate and graduate levels.
- Pursuing innovation, excellence, and leadership in scholarly activities.

- Serving the engineering profession and humanity with faculty and student expertise.

The vision of the Department of Mechanical and Energy Engineering is to create an outstanding, innovative, and interdisciplinary student-centered academic program that emphasizes the fundamentals of mechanical engineering, modern applications pertaining to energy production, power management and distribution, and life-long learning skills, within a research-and-project oriented environment.

## Programs of Study

The department currently offers programs in the following areas:

- Bachelor of Science, and
- Master of Science, both with a major in mechanical and energy engineering.

## Bachelor of Science with a Major in Mechanical and Energy Engineering

The Bachelor of Science degree with a major in mechanical and energy engineering follows an interdisciplinary and innovative curriculum that combines essentials of the classical discipline of mechanical engineering with the deeper knowledge of the dynamic field of energy studies. Thus, the BS degree combines the fundamentals of mechanical engineering with a broad specialization on subjects related to energy production, management, and distribution. The goal of the mechanical and energy engineering department is to provide a curriculum and course of training that will prepare undergraduates not only for today's challenges, but also for future challenges in a fast-paced, global, and diverse society. As a consequence, this program emphasizes the fundamentals, modern methods, processes and technologies of engineering science. It also gives students the tools to learn by themselves and to pursue lifelong learning. Graduates of this program are well-prepared for industry careers and pursuit of advanced engineering degrees.

The mechanical and energy engineering curriculum is very broad. It is similar to a traditional mechanical engineering curriculum with the notable addition of several required energy-related courses and elective courses that emphasize energy applications and materials. In their first year, students in this program will take preparatory courses in mathematics and the basic sciences, including physics, computer science and chemistry. The required upper-division engineering courses are in the broad areas of energy-thermal-fluid science; mechanics and materials; dynamics, design and controls; and environmental impact of energy production and use. Technical elective courses range from alternative

energy to nuclear power. The program also emphasizes studies in the humanities and social sciences, artistic ingenuity, professionalism, technical communication and engineering ethics.

The department also offers unique curriculum-integrated enrichment opportunities including undergraduate research, co-ops, and study abroad exchanges with international partner schools. Minors that provide breadth of experience from other disciplines, including mathematics and hospitality management, can also be integrated seamlessly into the department's four-year bachelor's degree plan.

The BS degree with a major in mechanical and energy engineering is the newest program in the College of Engineering at the University of North Texas. The curriculum of this program has been designed to meet the ABET criteria for accreditation in the general category of "Mechanical Engineering." According to the ABET procedures, accreditation for this program will be sought after the program graduates its first class of students.

## Degree Requirements

- Hours Required and General/College Requirements:** A minimum of 127 semester hours, of which 42 must be advanced, and fulfillment of degree requirements for the Bachelor of Science degree as specified in the "General University Requirements" in the Academics section of this catalog and the College of Engineering requirements.
- Major Requirements:** A minimum of 43 semester hours, including MEEN 1110, MEEN 1210, MEEN 2130, MEEN 2210, MEEN 2250, MEEN 3110, MEEN 3120, MEEN 3125, MEEN 3130, MEEN 3210, MEEN 3230, MEEN 3240, MEEN 3242, MEEN 4150, MEEN 4250.
- Other Required Courses:**
  - MATH 1710, MATH 1720, MATH 2700, MATH 2730 and MATH 3310
  - CHEM 1415/1435 (or CHEM 1410/1420 and CHEM 1430/1440)
  - PHYS 1710/1730, PHYS 2220/2240
  - CSCE 1020; EENG 2610; ENGR 2060 (may be used to satisfy a portion of the Understanding the Human Community requirement of the University Core Curriculum and College of Engineering Foundations requirement), ENGR 2332, ENGR 3450, ENGR 3451
  - TECM 2700 (College of Engineering Foundations requirement)
- Energy Engineering Electives:** 6 semester credit hours from the list of approved departmental energy engineering elective courses

5. **Technical Electives:** 6 semester credit hours from the list of approved departmental general advanced elective courses.

6. **Other Requirements:** A grade point average of at least 2.5 is required for all mechanical and energy engineering courses.

### BS with a Major in Mechanical and Energy Engineering

*The following is one suggested four-year degree plan. Students are encouraged to see their advisor each semester for help with program decisions and enrollment. Students are responsible for meeting all course prerequisites.*

#### FRESHMAN YEAR

FALL	HOURS
CHEM 1415, General Chemistry for Engineering Majors**	3
CHEM 1435, General Chemistry Laboratory for Engineering Majors**	1
CSC E 1020, Program Development	4
ENGL 1310, College Writing I or ENGL 1313, Computer Assisted College Writing I*	3
MATH 1710, Calculus I	4
MEEN 1110, Mechanical and Energy Engineering Practice I	<u>1</u>
Total	16

SPRING	HOURS
TECM 2700, Technical Writing*	3
HIST 2610, United States History to 1865*	3
MATH 1720, Calculus II	3
MEEN 1210, Mechanical and Energy Engineering Practice II	1
PHYS 1710, Mechanics	3
PHYS 1730, Laboratory in Mechanics	1
Visual and Performing Arts* (ART 1300, Art Appreciation for Non-Art Majors, recommended)	<u>3</u>
Total	17

#### SOPHOMORE YEAR

FALL	HOURS
ENGR 2060, Professional Presentations (may be used to satisfy the Understanding the Human Community requirement*)	3
MATH 2700, Linear Algebra and Vector Geometry	3
MATH 3310, Differential Equations for Engineering Majors	3
MEEN 2130, Statics and Dynamics	4
PHYS 2220, Electricity and Magnetism	3
PHYS 2240, Laboratory in Wave Motion, Electricity, Magnetism and Optics	<u>1</u>
Total	17

SPRING	HOURS
ENGR 2332, Mechanics of Materials	4
HIST 2620, United States History Since 1865*	3
MATH 2730, Multivariable Calculus	3
MEEN 2210, Thermodynamics	3
MEEN 2250, Computer Aided Engineering	<u>3</u>
Total	16

#### JUNIOR YEAR

FALL	HOURS
EENG 2610, Circuit Analysis	3
MEEN 3110, Applied Thermodynamics	3
MEEN 3120, Fluid Mechanics	3
MEEN 3125, Thermal Engineering Projects	2
MEEN 3230, Dynamics, Vibrations and Control	3
MEEN 3240, Mechanical and Energy Engineering Laboratory I	<u>2</u>
Total	16

SPRING	HOURS
ENGR 3450, Engineering Materials	3
ENGR 3451, Engineering Materials Laboratory	1
MEEN 3130, Machine Elements	3
MEEN 3210, Heat Transfer	3
MEEN 3242, Mechanical and Energy Engineering Laboratory II	2
Humanities* (PHIL 2500, Introduction to Contemporary Environmental Issues, recommended)	<u>3</u>
Total	15

#### SENIOR YEAR

FALL	HOURS
PSCI 1040, American Government*	3
MEEN 4150, Mechanical and Energy Engineering Design I	3
MEEN Energy Engineering Elective	3
MEEN Technical Elective (advanced)	3
Understanding the Human Community* (SMHM 4750, Managing a Diverse Workforce, recommended)	<u>3</u>
Total	15

SPRING	HOURS
MEEN 4250, Mechanical and Energy Engineering Design II	3
PSCI 1050, American Government*	3
MEEN Energy Engineering Elective	3
MEEN Technical Elective (advanced)	3
Social and Behavioral Sciences* (GEOG 1170, Culture, Environment and Society, recommended)	<u>3</u>
Total	15

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## **Graduate Degrees**

The Department of Mechanical and Energy Engineering offers a degree program leading to the Master of Science. For information, consult the Graduate Catalog.

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