

- MTSE 5010, Bonding, Structure and Crystallography
- MTSE 5500, Electronic, Optical and Magnetic Materials
- MTSE 6100, Mechanical Properties of Materials

2. Electives (30 hours)

Thirty credit hours may be chosen from materials science or related fields, as approved by the major professor and the advisory committee.

3. Individual Research (26–34 hours)

- MTSE 6940, Individual Research

Additional course work may be taken in lieu of individual research hours.

4. Seminar in Materials Science and Engineering (2–10 hours)

- MTSE 5700, Seminar in Materials Science and Engineering

Please see “Seminar in Current Topics in Materials Science”.

5. Dissertation (12 hours minimum)

- MTSE 6950, Doctoral Dissertation

Seminar in Current Topics in Materials Science and Engineering

All doctoral students are expected to attend MTSE 5700 during each term/semester of full-time graduate study. A seminar based on the student's dissertation research must be given during the regularly scheduled class time prior to and in addition to the formal defense of the dissertation.

Minor in Materials Science and Engineering

Students pursuing degrees in other disciplines can apply for a minor in materials science through the department office. The minor of materials science requires 12 hours of materials science related course work approved by the department graduate adviser.

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.

Department of Mechanical and Energy Engineering

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Efstathios E. Michaelides, Chair

Graduate Faculty: Boetcher, Choi, Feng, Michaelides.

The Department of Mechanical and Energy Engineering at the University of North Texas is committed to academic excellence in graduate education and research in all areas pertinent to energy conservation and thermal engineering. The goals of the department and its faculty are (1) to provide high quality and innovative educational programs at the undergraduate and graduate levels; to foster lifelong learning; to promote professionalism and ethical standards; and to help students develop leadership qualities; (2) to pursue excellence in scholarly research in areas of mechanical and energy engineering; (3) to collaborate with engineers in industry, national laboratories and government agencies in the solution of national and global problems related to energy use and its environmental impacts.

Research

Research areas within the department include the following:

- **Advanced energy conversion** with applications to energy conversion, alternative energy sources, and energy conservation methods and systems.
- **Computational fluid dynamics (CFD) and computational heat transfer (CHT)** with applications to environmental effects of energy production, global environmental changes, buoyant flows, fluid distribution manifolds, biological flow and heat transfer, and thermal characteristics of electronic equipment.
- **Micro/nano-scale science and technology** with applications to femto-second laser machining, plasma dynamics, nano-scale fabrication, non-tube properties and the transport properties of micro- and non-particles.
- **Particulate and multiphase flow and heat transfer** with applications to the combustion of fuels, fluidized bed reactors, sedimentation, aerosols and environmental effects of energy production.

Degree Program

The department offers a graduate program leading to the following degree:

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

Admission Requirements

The admission process has two parts:

1. Students must apply through the appropriate University admissions office and meet the minimum requirements for graduate admission to the University of North Texas.

U.S. students submit the Toulouse School of Graduate Studies application online and send by mail the application fee and official transcripts from all universities or colleges attended. For details visit www.gradschool.unt.edu.

International students must apply through the International Admissions Office online and send by mail the application fee and official academic documentation from all schools attended. For details visit www.international.unt.edu.

2. Students also submit the following materials directly to the Department of Mechanical and Energy Engineering:

- a detailed resume that includes educational experience; relevant work history; and research experience,
- three letters of recommendation, and
- official scores for the Graduate Record Examination (GRE) for all three sections.*

**The department does not require GRE scores from UNT graduates for admission to its program. However, students who apply for financial aid are strongly encouraged to take the GRE.*

Master of Science Degree Program

All students pursuing the master's degree with a major in mechanical and energy engineering must plan their degree program with the assistance of their major professor and their advisory committee. The requirement for graduation is at least 30 semester credit hours and maintenance of at least a B average in all graduate courses. All candidates for the masters' degree must take the following required courses:

- MEEN 5100, Advanced Energy Conversion, 3 hours
- MEEN 5110, Alternative Energy Sources, 3 hours
- MEEN 5112, Nuclear Energy, 3 hours
- MEEN 5120, Advanced Fluid Dynamics, 3 hours
- MEEN 5220, Computational Fluid Dynamics and Heat Transfer, 3 hours
- MEEN 5900, Special Problems (when taught as "Advanced Mathematical Methods"), 3 hours

Option 1, Master of Science, Thesis

The graduate credit requirement for the Master of Science degree is 30 semester credit hours chosen as follows:

1. Twenty-four semester credit hours of course work chosen from the graduate-level courses offered by the university. A minimum of 18 semester credit hours of this course work must be chosen from the graduate-level (5000 or higher) courses offered by the Department of Mechanical and Energy Engineering. The rest of the course work may be chosen from other departments with the approval of the department chair and the student's major professor.

2. Six semester credit hours of MEEN 5950 (Master's Thesis). Work for the master's thesis is comprised of an independent and original study. As part of these requirements, the student must present and defend a written thesis that must be approved by the major professor and the advisory committee and filed with the graduate dean's office. The thesis must conform to the graduate school thesis requirements, which may be found at www.gradschool.unt.edu. It is expected that this material will be of archival quality.

Option 2, Master of Science, Non-Thesis

The graduate credit requirement for the MS degree is 30 semester credit hours chosen as follows:

1. Thirty semester credit hours of course work chosen from the graduate level courses offered by the university. A minimum of 21 semester credit hours of course work must be chosen from the graduate level courses offered in the area of mechanical and energy engineering. The rest of the course work may be chosen from other departments with approval of the department chair and the student's major professor.
2. The students in this option must compose a report on an independent research problem and give a formal seminar/presentation to his or her advisory committee.

Examinations

An oral presentation of the master's thesis is required. A decision on acceptance of the thesis will be made by the student's advisory committee. A decision on the acceptance of the report for an independent research problem will be made by the student's advisory committee. Guidelines for the independent research problem and thesis preparation may be found at www.mee.unt.edu. For the thesis, additional preparation guidelines can be found at www.gradschool.unt.edu.

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