

# *Mechanical Engineering with Concentration in General Mechanical Engineering, MSME*

## Overview

While pursuing a Master of Science (MS) in Mechanical Engineering (<https://mie.northeastern.edu/academics/graduate-studies/ms-mece/>), students may choose the general mechanical engineering concentration.

### GENERAL DEGREE REQUIREMENTS

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved coursework (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: coursework option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the Program Requirements tab. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

### ACADEMIC AND RESEARCH ADVISORS

All nonthesis students are advised by the faculty advisor designated for their respective concentration or program. Students willing to pursue the thesis option must first find a research advisor within their first year of study. The research advisor will guide the students' thesis work, and thesis reader(s) may be assigned at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty. If the research advisor is outside the MIE department, before the thesis option can be approved, a faculty member with 51 percent or more appointments in the MIE department must be chosen as co-advisor, and a petition must be filed and approved by the co-advisor and the MIE Graduate Affairs Committee. Thesis option students are advised by the faculty advisor of their concentration before they select their research advisor(s). The research advisor and co-advisor must serve as thesis readers.

### PLAN OF STUDY AND COURSE SELECTION

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the coursework requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their coursework needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form not only helps the students manage their coursework but it also helps the department to plan for requested course offerings. The PS form may be modified at any time as the students progress in their degree programs.

Students pursuing study or research under the guidance of a faculty member can choose project option by taking Master's Project (ME 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both the faculty member (instructor for Master's Project) and the student's academic advisor. The petition must clearly state the reason for taking the project course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students pursuing coursework option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour (ME 7978). An independent study must be approved by the academic advisor. The petition must clearly state the instructor; the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. When taking thesis or project options, the independent study course cannot be taken.

### OPTIONS FOR MS STUDENTS (COURSEWORK ONLY, PROJECT, OR THESIS)

Students accepted into any of the MS programs in the MIE department can choose one of the three options: coursework only, project, or thesis. Please see the Program Requirements tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within the first year of their study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete 8 semester hours of thesis. Students are strongly encouraged to complete their 8 semester hours of Thesis (ME 7990) over two consecutive semesters.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

### CHANGE OF PROGRAM/CONCENTRATION

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the beginning of their second full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must not be in the first semester of their current program, must have a 3.300 GPA, and have completed at least 8 semester hours of required coursework in their sought program at Northeastern.

**GRADUATE CERTIFICATE OPTIONS**

Students enrolled in a master's degree have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (<https://catalog.northeastern.edu/graduate/engineering/graduate-certificate-programs/>).

**GORDON INSTITUTE OF ENGINEERING LEADERSHIP****Master's Degree in Mechanical Engineering with Concentration in General Mechanical Engineering with Graduate Certificate in Engineering Leadership**

Students may complete a Master of Science in Mechanical Engineering with Concentration in General Mechanical Engineering in addition to earning a Graduate Certificate in Engineering Leadership (<https://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-leadership-graduate-certificate/>). Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved mechanical engineering technical courses.

**Program Requirements**

Complete all courses and requirements listed below unless otherwise indicated.

**Core Requirements**

Code	Title	Hours
<b>Mathematics Competency</b>		
ME 6200	Mathematical Methods for Mechanical Engineers 1	4
<b>Thermofluids Competency</b>		
Complete 4 semester hours from the following:		4
ME 5685	Solar Thermal Engineering	
ME 5690	Gas Turbine Combustion	
ME 5695	Aerodynamics	
ME 7295	Multiscale Flow and Transport Phenomena	
ME 7300	Combustion and Air Pollution	
ME 7305	Fundamentals of Combustion	
ME 7310	Computational Fluid Dynamics with Heat Transfer	
<b>Mechanics/Mechatronics Combined Competency</b>		
Complete 4 semester hours from the following:		4
EECE 5610	Digital Control Systems	
EECE 5666	Digital Signal Processing	
ME 5245	Mechatronic Systems	
ME 5250	Robot Mechanics and Control	
ME 5650	Advanced Mechanics of Materials	
ME 5654	Elasticity and Plasticity	
ME 5655	Dynamics and Mechanical Vibration	
ME 5657	Finite Element Method 1	
ME 5659	Control Systems Engineering	
ME 7238	Finite Element Method 2	
<b>Materials Competency</b>		
Complete 4 semester hours from the following:		4
ME 5600	Materials Processing and Process Selection	
ME 5620	Fundamentals of Advanced Materials	
MATL 5380	Particulate Materials Processing	
MATL 6250	Soft Matter	
MATL 6270	Principles, Devices, and Materials for Energy Storage and Energy Harvesting	
MATL 6285	Structure, Properties, and Processing of Polymeric Materials	
or any MATL courses		

**OPTIONS**

Complete one of the following options:

**COURSEWORK OPTION**

Code	Title	Hours
Complete 16 semester hours in the following subject areas:		16
ME, MATL		

**PROJECT OPTION**

Code	Title	Hours
ME 7945	Master's Project	4
<b>Electives</b>		
Complete 12 semester hours in the following subject areas:		12
ME, MATL		

**THESIS OPTION**

Code	Title	Hours
ME 7990	Thesis (required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship)	8
<b>Electives</b>		
Complete 8 semester hours in the following subject areas:		8
ME, MATL		

**Program Credit/GPA Requirements**

32 total semester hours required  
 Minimum 3.000 GPA required