

# MS in Mechanical and Aerospace Engineering

## Degree Requirements

The master's requires a minimum of 30 credit hours beyond the bachelor's degree. Within the 30 credit hours, credits may be awarded for a special project report or thesis. Requirements for the MS degree can be met in three ways: online-only option, special project option, or the thesis option.

For the online-only option, a minimum of 9 credit hours of MAE 8000 level courses is required, with a minimum of 15 credit hours of MAE 7000 or 8000 level courses and a minimum of 3 credit hours of Problems in Mechanical and Aerospace Engineering (MAE 8085) for special project. The online-only option does not have a seminar requirement, and there is no math requirement.

For the special project option, 3-5 credit hours of MAE Problems is required in addition to 1 credit hour of MAE seminar (MAE 8087). The remaining hours must consist of a minimum of 9 credit hours of MAE 8000 level courses and a maximum of 15 credit hours of 7000 or 8000 level courses inside or outside of MAE. There is no math requirement.

For the thesis option, a minimum of 9 credit hours of MAE 8000 level courses is required, with a minimum of 12 credit hours of 7000 or 8000 level courses inside or outside of MAE. Three credit hours of 7000 or 8000 level approved math is required. Up to 8 credit hours of MAE 8990 (Research) is allowed. One credit hour of MAE seminar (MAE 8087) is required.

A thesis or a report is approved by designated faculty committees and is deposited in the department libraries.

Passing the MS final exam administered by the thesis committee fulfills the degree requirements for those taking the special project or thesis option.

## Core Course Requirements

Students must take two core courses from one of the four core subject areas listed below. A thesis committee may approve, by majority vote, that the core course requirement be waived for a M.S student's plan of study.

**Students in Dynamics and Control area must take at least two from the following:**

MAE 7660	Vibration Analysis	3
MAE 8001	Advanced Topics in Mechanical and Aerospace Engineering (Optimal Control)	3
MAE 8280	Finite Element Methods	3
MAE 8620	Advanced Dynamics	3
MAE 8750	Nonlinear Control	3
MAE 8320	Continuum Mechanics	3

**Students in Thermal/Fluids area must take at least two from the following:**

MAE 7310	Intermediate Heat Transfer	3
MAE 7320	Design of Thermal Systems	3
MAE 7420	Intermediate Fluid Mechanics	3
MAE 7430	Introduction to Computational Fluid Dynamics and Heat Transfer	3

MAE 8311	Heat Transfer-Convection	3
MAE 8315	Multiphase Heat Transfer	3
MAE 8380	Advanced Thermodynamics	3
MAE 8430	Introduction to Two Phase Flow	3

**Students in Design and Manufacturing area must take at least two from the following:**

MAE 7001	Topics in Mechanical and Aerospace Engineering (*) Additive Manufacturing of Metals (no other 7001 topics course allowed)	3
MAE 7290	Welding Engineering	3
MAE 7910	Mechanism Design	3
MAE 7680	Introduction to MEMS	3
MAE 8510	Manufacturing Design	3

**Students in Mechanics and Materials area must take at least two from the following:**

MAE 8250	Plasma Technology for Materials Engineering	3
MAE 8280	Finite Element Methods	3
MAE 8330	Theory of Elasticity	3
MAE 8320	Continuum Mechanics	3
MAE 8240	Mechanical Behavior of Materials	3
MAE 8001	Advanced Topics in Mechanical and Aerospace Engineering (Materials Characterization)	3
MAE 8001	Advanced Topics in Mechanical and Aerospace Engineering (Wave Propagation)	3

## Plan of Study

A plan of study is developed by the student and the advisor, subject to approval.

## Thesis/Special Project Requirements

### Special Project

If the report option is chosen, a report must be prepared and submitted to the MAE Department. Reports follow the same manuscript guidelines as a thesis.

- Minimum 9 hrs of 8000 level MAE courses
- Maximum of 15 hrs 7000 level courses
- Maximum of 15 hrs 8000 level courses (excluding 1 hr seminar)
- 3-5 hrs of MAE problems
- 1 hr seminar

### Thesis

If the *thesis* option is chosen, a master's thesis must be prepared and submitted to the Graduate School as a PDF with required supplemental materials (<https://gradschool.missouri.edu/academics/thesis-dissertation/>). The students will be sent "Guidelines for Preparing Theses and Dissertations (<https://gradschool.missouri.edu/student-resources/policies/>)" from the Graduate School as soon as their Program of Study Form is submitted. See also: Thesis Process for Master's Students. (<https://gradschool.missouri.edu/academics/thesis-dissertation/thesis-process/>)

- Minimum 9 hrs of 8000 MAE courses
- Maximum of 12 hrs 7000 level courses

- Maximum of 12 hrs 8000 level courses (excluding 1 hr seminar)
- 3 hrs 7000 or 8000 math (except Mathematics History)
- Maximum of 8 hrs research
- 1 hr seminar

## Admissions

### Admission Contact Information

muengrgraduatesup1@missouri.edu

### Application Deadline for all applicants

Fall deadline: May 31 (priority deadline Jan. 1)

Spring deadline: October 31 (priority deadline Oct 1)

Summer deadline: April 30

### Admission Criteria

- BS in same or closely related field
- Minimum GPA: 3.0 during last 2 years
- Minimum GRE Score: 298 combined score on Verbal and Quantitative sections; GRE not required for Online-only
- Minimum TOEFL score: 80
- Minimum academic IELTS overall score: 6.5
- Resume

**Note:** Lower GPAs require special action and substantiation, such as good test scores on the GRE or other recognized examinations.

### How to apply to the MAE master's program:

**Step 1:** All documents should be uploaded directly at <https://applygrad.missouri.edu/apply> (<https://applygrad.missouri.edu/apply/>).

**Step 2:** Required documents:

- Unofficial Transcripts (all Universities and Colleges attended) Uploaded in Slate (<http://gradstudies.missouri.edu/admissions/apply/>)
- TOEFL/IELTS score - sent electronically to the University by ETS (Institution Code 6875 Department Code 1502)
- 3 letters of recommendation - uploaded in Slate by the recommenders. Letters must come from a school e-mail address, not personal accounts (like yahoo, gmail, etc).
- GRE score - sent electronically by ETS (Waived for graduate applicants 1/1/2021 - 4/30/2023)
- Statement of Objectives - one page letter telling about yourself and the area you will study if accepted (uploaded in Slate)
- CV/Résumé (Uploaded in Slate)

#### Contact:

Mechanical & Aerospace Engineering, Graduate Admissions  
muengrgraduatesup1@missouri.edu