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. Alternatively, the requirements may be satisfied through online coursework.

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. Additional external credit hours at the 7000 or 8000 level must consist of technical courses (typically Engineering or Science) and be approved by the student's advisor and the MAE director of graduate studies. 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 committee fulfills the degree requirements for those taking the special project or thesis option. Completion of the coursework described for the online-only option fulfills the degree requirements.

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 8300: Microscale Heat Transfer 3
- MAE 8311: Heat Transfer-Convection 3

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

- MAE 8300: Advanced Mechanical System Modeling and Optimization 3
- MAE 8320: Advanced Topics in Mechanical and Aerospace Engineering (Materials Characterization) 3
- MAE 8990: Advanced Topics in Mechanical and Aerospace Engineering (Wave Propagation) 3

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MAE 8420</td>
<td>Computational Heat Transfer and Fluid Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>MAE 8430</td>
<td>Introduction to Two Phase Flow</td>
<td>3</td>
</tr>
<tr>
<td>MAE 7380</td>
<td>Intermediate Thermodynamics</td>
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**Students in Design and Manufacturing area must take at least two from the following:**

- MAE 7290: Welding Engineering 3
- MAE 7930: Applied Mechanical Optimization 3
- MAE 8510: Manufacturing Design 3
- MAE 8910: Modular Machine Tool Design 3
- MAE 8930: Advanced Mechanical System Modeling 3

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<tr>
<td>MAE 8001</td>
<td>Theory of Plasticity</td>
<td>3</td>
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<tr>
<td>MAE 8330</td>
<td>Theory of Elasticity</td>
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<tr>
<td>MAE 8320</td>
<td>Continuum Mechanics</td>
<td>3</td>
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<tr>
<td>MAE 8240</td>
<td>Mechanical Behavior of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MAE 8001</td>
<td>Advanced Topics in Mechanical and Aerospace Engineering (Materials Characterization)</td>
<td>3</td>
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**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 (http://gradschool.missouri.edu/policies/thesis-dissertation/guidelines/checklist-ch2.php). The students will be sent "Guidelines for Preparing Theses and Dissertations (http://gradschool.missouri.edu/policies/thesis-dissertation/guidelines/)" from the Graduate School as soon as their Program of Study Form is submitted. See also: Thesis Process for Master's Students. (http://gradschool.missouri.edu/academics/thesis-dissertation/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
• 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 S (http://gradstudies.missouri.edu/admissions/apply)late
• 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 (Institution Code 6875 Department Code 1502)
• 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