MASTER OF MECHANICAL ENGINEERING (MME) DEGREE

Program Learning Outcomes for the MME Degree

Upon completing the MME degree, students will be able to:

1. Demonstrate an advanced command of Mechanical Engineering fieldwork.
2. Communicate scientific ideas effectively in writing and when speaking.

Requirements for the MME Degree

The MME degree is a non-thesis master's degree. For general university requirements, please see Non-Thesis Master's Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/).

Students pursuing the MME degree must complete:

- A minimum of 10 courses (30 credit hours) to satisfy degree requirements.
- A minimum of 30 credit hours of graduate-level study (graduate semester credit hours, coursework at the 500-level or above).
- A minimum of 24 graduate semester credit hours must be taken at Rice University.
- A minimum of 24 graduate semester credit hours must be taken in standard or traditional courses (with a course type of lecture, seminar, laboratory, lecture/laboratory).
- A minimum residency enrollment of one fall or spring semester of part-time graduate study at Rice University.
- A maximum of 2 courses (6 graduate semester credit hours) from transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies (p. 2) tab.
- A minimum of 24 credit hours from departmental (MECH) course offerings, including the area of specialization.
- The requirements for one area of specialization. The MME degree program offers two areas of specialization:
  - Aerospace Engineering (p. 2), or
  - Mechanical Engineering (p. 2).
- A minimum overall GPA of 2.67 or higher in all Rice coursework.
- A minimum program GPA of 3.00 or higher in all Rice coursework that satisfies requirements for the non-thesis master's degree.

The professional master's degree in Mechanical Engineering (MME) is a non-thesis degree program intended for students who have completed a 4-year bachelor's program in engineering and wish to join the workforce as practicing professionals, rather than pursuing a research oriented or academic career. It offers preparation in advanced engineering topics in order to enhance an engineer's technical qualifications and increases competitiveness in the job market.

The MME program is open to students who have shown academic excellence in their undergraduate studies. Students who have a BS or BA degree in any field of engineering or related study may apply, although some may need to fulfill prerequisites or take remedial courses to earn the MME degree. Students may enroll on a full or part-time basis.

Lists of required and suggested courses are available from the department. Students should develop a specific plan of study based on their particular interests and discussions with their advisor.

The courses listed below satisfy the requirements for this degree program. In certain instances, courses not on this official list may be substituted upon approval of the program's academic advisor, or where applicable, the department or program's Director of Graduate Studies. Course substitutions must be formally applied and entered into Degree Works by the department or program's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/). Additionally, these must be approved by the Office of Graduate and Postdoctoral Studies. Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Total Credit Hours Required for the MME Degree

30

Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>MECH 501</td>
<td>DYNAMICS AND CONTROL OF MECHANICAL SYSTEMS</td>
<td>12</td>
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<tr>
<td>or MECH 508</td>
<td>NONLINEAR SYSTEMS: ANALYSIS AND CONTROL</td>
<td></td>
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<tr>
<td>CMOR 508 / ELEC 508</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 517</td>
<td>FINITE ELEMENT ANALYSIS</td>
<td></td>
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<tr>
<td>CEVE 517</td>
<td></td>
<td></td>
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<tr>
<td>MECH 554 / BIOE 554 / CEVE 554</td>
<td>COMPUTATIONAL FLUID MECHANICS</td>
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</tr>
<tr>
<td>MECH 588</td>
<td>DESIGN OF MECHATRONIC SYSTEMS</td>
<td></td>
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<tr>
<td>or MECH 596</td>
<td>INTRODUCTION TO ROBOTICS</td>
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<tr>
<td>COMP 598 / ELEC 598</td>
<td></td>
<td></td>
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<tr>
<td>MECH 594</td>
<td>INTRODUCTION TO AERONAUTICS</td>
<td></td>
</tr>
<tr>
<td>MECH 599</td>
<td>CURRENT TOPICS IN MECHANICAL ENGINEERING</td>
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</tbody>
</table>

Area of Specialization

Select 1 of the following Areas of Specialization (see below for Areas of Specialization):

Aerospace Engineering
Mechanical Engineering

Elective Requirements

Select 4 courses from approved departmental (MECH) course offerings at the 500-level or above: 1

12

Total Credit Hours

30

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Approved departmental course offerings are MECH course offerings at the 500-level or above taught by faculty with a tenure home or special teaching appointment in MECH. In exceptional cases, 2 courses, or a total of 6 credit hours, at the 500-level or above can be taken outside of the MECH department. This would require special approval from the department after reviewing the rigor and applicability of the class to the applicant’s plan of study.

A minimum of 30 credit hours at the 500-level or above is required to earn the MME degree. Regardless of the student’s previously earned undergraduate degree at the time of entrance into the graduate program, no credit hours of research coursework may be permitted in lieu of the required coursework outlined above.

Students entering with a BS degree:
• 30 credit hours of coursework

Students entering with a BA degree (or other bachelor’s degree):
• 30 credit hours of coursework

### Areas of Specialization

#### Area of Specialization: Aerospace Engineering

Students pursuing the Aerospace Engineering area of specialization must complete:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 578</td>
<td>ORBITAL MECHANICS AND MISSION DESIGN</td>
<td>6</td>
</tr>
<tr>
<td>MECH 590</td>
<td>AEROSPACE PROPULSION</td>
<td></td>
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<tr>
<td>MECH 591</td>
<td>GAS DYNAMICS</td>
<td></td>
</tr>
<tr>
<td>MECH 592 / NSCI 591</td>
<td>DESIGN FOR AEROSPACE ENVIRONMENTS</td>
<td></td>
</tr>
<tr>
<td>MECH 596</td>
<td>INTRODUCTION TO FLIGHT MECHANICS</td>
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<tr>
<td>MECH 691</td>
<td>INTRODUCTION TO HYPERSONIC AERODYNAMICS</td>
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</tbody>
</table>

Total Credit Hours 6

#### Area of Specialization: Mechanical Engineering

Students pursuing the Mechanical Engineering area of specialization must complete:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>MECH 502</td>
<td>VIBRATIONS</td>
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<tr>
<td>MECH 530</td>
<td>TRIBOMECHADYNAMICS</td>
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<tr>
<td>MECH 575</td>
<td>INTRODUCTION TO HYDRODYNAMIC STABILITY</td>
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<tr>
<td>MECH 582</td>
<td>CONVETIVE HEAT TRANSFER</td>
<td></td>
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<tr>
<td>MECH 584</td>
<td>MICROSCOPIC THERMODYNAMICS AND TRANSPORT</td>
<td></td>
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<tr>
<td>MECH 587</td>
<td>INTERFACIAL PHENOMENA, CAPILLARITY, AND WETTING</td>
<td></td>
</tr>
<tr>
<td>MECH 589</td>
<td>MICROFLUIDICS: FUNDAMENTALS AND APPLICATIONS</td>
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Total Credit Hours 6

### Policies for the MME Degree

#### Department of Mechanical Engineering Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the department of Mechanical Engineering publishes a graduate program handbook, which can be found here: [https://gradhandbooks.rice.edu/2023_24/Mechanical_Engineering_Graduate_Handbook.pdf](https://gradhandbooks.rice.edu/2023_24/Mechanical_Engineering_Graduate_Handbook.pdf)

#### Transfer Credit

For Rice University’s policy regarding transfer credit, see Transfer Credit ([https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer)). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

#### Departmental Transfer Credit Guidelines

Students pursuing the MME degree should be aware of the following departmental transfer credit guidelines:

- No more than 2 courses (6 credit hours) of transfer credit from U.S. or international universities of similar standing as Rice may apply towards the degree.
- Requests for transfer credit will be considered by the program director on an individual case-by-case basis.

### Additional Information

For additional information, please see the Mechanical Engineering website: [https://mech.rice.edu/](https://mech.rice.edu/)

### Opportunities for the MME Degree

#### Fifth-Year Master's Degree Option for Rice Undergraduate Students

In certain situations and with some terminal master’s degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master’s degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor’s degree and the master’s degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
• more information on this Undergraduate - Graduate Concurrent Enrollment opportunity, including specific information on the registration process can be found here (https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/).

Rice undergraduate students completing studies in science and engineering may have the option to pursue the Master of Mechanical Engineering (MME) degree. For additional information, students should contact their undergraduate major advisor and the MME program director.

**Additional Information**
For additional information, please see the Mechanical Engineering website: https://mech.rice.edu/