

# MASTER OF SCIENCE IN MECHANICAL AND AEROSPACE ENGINEERING

The master of science degree program advances knowledge through post-baccalaureate coursework. The program requires 32 credit hours. Students have the option of completing a thesis based on up to eight credit hours of research (MMAE 591) with the approval of a thesis adviser, or completing the program with courses, which may include up to six credit hours of projects (MMAE 594 or MMAE 597). In line with the department's approach to its graduate programs, a student has considerable flexibility, in consultation with their adviser, in formulating an M.S. program. Registration and 80%-class session attendance—required for a passing grade—in the Seminar course MMAE 593 is required of all M.S. graduate students (Non-thesis or Thesis) and Ph.D. students. A satisfactory grade is required, in each semester of full-time enrollment, to fulfill degree requirements.

Before completion of the first semester of graduate study, full-time students should select a permanent adviser. Graduate students pursuing the M.S. degree on a part-time basis should select a permanent adviser before registering for their twelfth credit hour. The student, in consultation with the adviser, prepares a program of study that reflects individual needs and interests. The adviser as well as the department's graduate studies committee and the department chair must approve this program. Students with the thesis option are required to pass an oral comprehensive examination on their thesis and related topics. The examination committee consists of at least three appropriate faculty members who are nominated by the thesis adviser and appointed by the department's graduate studies committee.

Admissions Requirements: GPA 3.0, GRE 300, TOEFL - according to university minimum standards and B.S. Degree in Mechanical Engineering, Aerospace Engineering, Electrical Engineering<sup>1</sup>, Physics, Industrial Engineering<sup>1</sup>, Computer Science<sup>1</sup> or Mathematics<sup>1</sup>.

<sup>1</sup>Requires the following course (or equivalent) to be taken prior to first term: MMAE 305 – Dynamics

## Master of Science in Mechanical and Aerospace Engineering (Coursework Only Option)

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	9
Maximum 700-Level Credit	6

Code	Title	Credit Hours
<b>Required Courses</b>		<b>(6-7)</b>
MMAE 501	Engineering Analysis I	3
Select one core course in major area of study (see below)		3-4
<b>Numerical Methods Elective</b>		<b>(3)</b>
Select three credit hours from the following:		3
MMAE 450	Computational Mechanics II	3
MMAE 500	Data Driven Modeling	3
MMAE 517	Computational Fluid Dynamics	3
MMAE 532	Advanced Finite Element Methods	3
MMAE 544	Design Optimization	3
MMAE 570	Computational Methods in Materials Science and Engineering	3
<b>Elective Courses</b>		<b>(22-23)</b>
Select 22-23 credit hours of 400-level and above MMAE courses <sup>1</sup>		22-23

<sup>1</sup> Students may include up to six credit hours of MMAE 594 or MMAE 597. (MMAE 594 graded as pass/fail only and MMAE 597 is graded with a letter grade.) Up to three credit hours of INTM courses may be used with adviser approval.

## Master of Science in Mechanical and Aerospace Engineering (Thesis Option)

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	9
Maximum 700-Level Credit	6

Code	Title	Credit Hours
<b>Required Courses</b>		<b>(9-10)</b>
MMAE 501	Engineering Analysis I	3
MMAE 502	Engineering Analysis II	3
Select one core course in major area of study (see below)		3-4
<b>Elective Courses</b>		<b>(14-17)</b>
Select 14-17 credit hours of 400-level and above MMAE courses		14-17
<b>Thesis Research</b>		<b>(6-8)</b>
MMAE 591	Research and Thesis M.S.	6-8

### Core Courses as Determined by Major Area of Study

Code	Title	Credit Hours
<b>Fluid Dynamics</b>		<b>(4)</b>
MMAE 510	Fundamentals of Fluid Mechanics	4
<b>Thermal Sciences</b>		<b>(3)</b>
MMAE 520	Advanced Thermodynamics	3
or MMAE 525	Fundamentals of Heat Transfer	
<b>Solids and Structures</b>		<b>(3)</b>
MMAE 530	Advanced Mechanics of Solids	3
<b>Dynamics and Controls</b>		<b>(3)</b>
MMAE 541	Advanced Dynamics	3
<b>Computer Aided Design and Manufacturing</b>		<b>(3)</b>
MMAE 545	Advanced CAD/CAM	3