

# MASTER OF SCIENCE IN MATERIALS SCIENCE AND 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 Materials Science and Engineering (Coursework Only Option)

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	12
Maximum 700-Level Credit	6

Code	Title	Credit Hours
<b>Required Courses</b>		<b>(18)</b>
Select a minimum of 18 credit hours from the Materials Science Courses below (p. 2)		18
<b>Elective Courses</b>		<b>(14)</b>
Select a minimum of 14 credit hours of 400-level and above MMAE courses <sup>1</sup>		14

<sup>1</sup> Students may include up to six credit hours of MMAE 594 Project for Master of Engineering Students.

## Master of Science in Materials Science and Engineering (Thesis Option)

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	12
Maximum 700-Level Credit	6

Code	Title	Credit Hours
<b>Required Courses</b>		<b>(18)</b>
Select a minimum of 18 credit hours from the Materials Science Courses below (p. 2)		18
<b>Elective Courses</b>		<b>(6-8)</b>
Select six to eight credit hours of 400-level and above MMAE courses <sup>1</sup>		6-8
<b>Thesis Research</b>		<b>(6-8)</b>
MMAE 591	Research and Thesis M.S.	6-8

<sup>1</sup> Students may include up to six credit hours of MMAE 594 Project for Master of Engineering Students.

**Materials Science Courses**

<b>Code</b>	<b>Title</b>	<b>Credit Hours</b>
MMAE 461	Failure Analysis	3
MMAE 470	Introduction to Polymer Science	3
MMAE 472	Advanced Aerospace Materials	3
MMAE 501	Engineering Analysis I	3
MMAE 520	Advanced Thermodynamics	3
MMAE 533	Fatigue and Fracture Mechanics	3
MMAE 554	Electrical, Magnetic and Optical Properties of Materials	3
MMAE 561	Solidification and Crystal Growth	3
MMAE 562	Design of Modern Alloys	3
MMAE 563	Advanced Mechanical Metallurgy	3
MMAE 564	Dislocations and Strengthening Mechanisms	3
MMAE 565	Materials Laboratory	3
MMAE 566	Problems in High-Temperature Materials	3
MMAE 567	Fracture Mechanisms	3
MMAE 568	Diffusion	2
MMAE 569	Advanced Physical Metallurgy	3
MMAE 570	Computational Methods in Materials Science and Engineering	3
MMAE 576	Materials and Process Selection	3
MMAE 578	Fiber Composites	3
MMAE 579	Advanced Materials Processing	3
MMAE 588	Additive Manufacturing	3