

### Manufacturing Engineering

#### Departmental Coordinators

##### Chemical and Environmental Engineering:

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The departments of Chemical and Environmental Engineering, Electrical and Computer Engineering, and Mechanical, Materials and Aerospace Engineering each offer interdisciplinary curricula leading to graduate degrees in manufacturing engineering.

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### Degrees Offered

Master of Manufacturing Engineering

Master of Science in Manufacturing Engineering

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### Research Areas, Centers and Facilities

Students should refer to descriptions under the three respective departments:

Chemical and Environmental Engineering  
Electrical and Computer Engineering  
Mechanical, Materials and Aerospace Engineering

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### Admission Requirements

Applicants are admitted to the Department of Chemical and Environmental Engineering, the Department of Electrical and Computer Engineering, or the Department of Mechanical, Materials and Aerospace Engineering. Admission requirements are the same as for the other master's programs in those departments. Students should refer to the specific department for general admission requirements (Chemical and Environmental Engineering pg.111, Electrical and Computer Engineering, pg.183, or Mechanical, Materials and Aerospace Engineering pg.241).

Meeting the minimum GPA and test score requirements does not guarantee admission. Test scores and GPA are just two of several important factors considered.

Coursework includes three components:  
Manufacturing core courses  
Departmental core manufacturing courses  
Electives approved by the department

Students must have an adviser and file a Program of Study that is approved by their respective department Graduate Studies Committee. The program accepts no more than six credit hours of 400-level courses not taken to fulfill an undergraduate degree requirement. In addition to the completion of coursework and thesis, the M.S. student is required to pass a comprehensive examination.

Rules and regulations regarding the comprehensive examination are the same as those for all other M.S. students in their respective departments.

With department approval, up to six hours of accelerated courses may be applied toward the professional master's degree. The department reserves the right to review and approve or deny the application for admission of any prospective degree-seeking student. Non-degree graduate students who intend to seek a graduate degree from the department must maintain a 3.0 GPA and must apply for admission as degree-seeking students prior to the completion of nine credit hours of study. A maximum of nine credit hours of approved coursework earned as a non-degree student and passed with a grade of "B" or better may be applied to the degree. Maintaining the minimum GPA requirement does not guarantee admission to any department graduate program.

**Master of Manufacturing Engineering**

30 credit hours

The Master of Manufacturing Engineering program (M.M.E.) is a course-only, professionally oriented degree program that requires a minimum of 30 credit hours. There is no thesis or comprehensive examination requirement. Full-time graduate students enrolled in the program should select a permanent adviser prior to completing their first semester of graduate study. A graduate student working for the degree on a part-time basis

should select a permanent adviser before registering for the twelfth credit hour. The student, in consultation with the adviser, then prepares a program of study that reflects her or his individual needs and interests. This program must be approved by the adviser, the department's Graduate Studies Committee, the department's chair, and the Graduate College. Students working toward this degree are not eligible for departmental financial support.

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**Master of Science in Manufacturing Engineering**

32 credit hours

Thesis

Oral comprehensive examination

The M.S. degree program is designed to equip students with advanced knowledge and to prepare them for careers in research and development. In line with the department's approach to its graduate programs, a student has considerable flexibility, in consultation with his or her program adviser, in formulating a program. The Master of Science in Manufacturing Engineering requires completion of a minimum of 32 credit hours of approved work, which includes six to eight credit hours of thesis research. Before completion of the first semester of graduate study, full-time students should select an area of

specialization and 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, then prepares a program of study that reflects individual needs and interests. This program must be approved by the adviser, the department's Graduate Studies Committee, the department's chair, and the Graduate College. After completion of the thesis, the student is required to pass an oral comprehensive examination on his or her thesis and related areas. 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.

# Manufacturing Engineering

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## Course requirements for M.S. in Manufacturing Engineering and Master of Manufacturing Engineering

Students must fulfill the manufacturing core courses as well as their respective departmental courses.

### Manufacturing core courses

MMAE 547 Computer Integrated Manufacturing  
AND

MMAE 560 Statistical Quality and Process Control OR  
CHE 560 Statistical Quality and Process Control

### Departmental core requirements

#### Chemical and Environmental Engineering

Two courses selected from:

CHE 507 Computer-Aided Design  
CHE 528 Analysis and Simulation  
of Chemical Processing  
CHE 530 Advanced Process Control  
CHE 555 Polymer Processing

#### Electrical and Computer Engineering

Two courses selected from:

ECE 426 Linear Integrated Circuits  
ECE 433 Real-Time Data Acquisition and Processing  
ECE 564 Control and Operation  
of Electric Power Systems  
ECE 481 Image Processing  
ECE 581 Computer and Robotic Vision

#### Mechanical and Aerospace Engineering

MMAE 505 Numerical Methods in Engineering  
MMAE 545 Advanced CAD/CAM  
MMAE 546 Advanced Manufacturing Engineering  
And one materials course.

For mechanical and aerospace engineering M.S. students, six to eight credit hours of MMAE 591 (Research and Thesis) and zero to three elective credit hours are required. For MME students, elective courses in manufacturing comprise the remaining seven credit hours.

### Materials Science and Engineering

One course selected from:

MMAE 445 CAD/CAM with Numerical Control  
MMAE 545 Advanced CAD/CAM  
MMAE 546 Advanced Manufacturing Engineering  
MMAE 576 Materials and Process Selection

One course selected from:

MMAE 475 Powder Metallurgy  
MMAE 574 Ferrous Transformations  
MMAE 575 Ferrous Products: Metallurgy and Manufacture  
MMAE 577 Lasers in Manufacturing

For materials science and engineering M.S. students, 12 to 15 credit hours of elective courses and five to eight credit hours of MMAE 591 (Research and Thesis) are required. MME students must take elective courses in manufacturing to comprise the remaining 18 credit hours.

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## Course Descriptions

Students should consult the three respective department listings:

Chemical and Environmental Engineering (page 111)

Electrical and Computer Engineering (page 183)

Mechanical, Materials and Aerospace Engineering  
(page 241)