**Mechanical Engineering**

**Master of Science in Mechanical Engineering (M.S.M.E.) Degree**

**DEGREE INFORMATION**

**Priority Admission Application Deadlines:**

**Fall:** February 15

**Spring:**  October 15

**Summer:** February 15

International applicant deadlines:

<http://www.grad.usf.edu/majors>

**Minimum Total Hours:** 30

**Level:** Masters

**CIP Code:** 14.1901

**Dept. Code:** EGR

**Major/College Codes:** EME EN

**Approved:** 1981

**Also offered as an Accelerated Major:**

Mechanical Engineering (BSME) / Mechanical Engineering (MSME)

**CONTACT INFORMATION**

**College:** Engineering

**Department:** Mechanical Engineering

**Contact Information:** [www.grad.usf.edu](http://www.grad.usf.edu/)

**MAJOR INFORMATION**

The Department offers graduate majors leading to the M.S.M.E. and Ph.D. in Mechanical Engineering.

Research opportunities are available in the following areas: Mechanism Design, Kinematics, System Dynamics and Vibrations, Mechanical Controls, Tribology, Mechanical Design, Robotics, Rehabilitation Engineering, Composite Materials, Solid Mechanics, Fluid Dynamics, Thermal Energy Systems, Microelectronic Device Thermal Management, Clean and Renewable Energy Systems, Micro and Nano scale materials and systems, MEMS, Biosensors, Biofluids, Biomedical Engineering, and Engineering Education.

Department facilities include the following laboratories: Computational Fluid Dynamics, Computational Solid Mechanics, Computer-Aided Design, Dynamic Systems, Hydraulics, Rehabilitation Engineering, Robotics, Biofuel cells and Biomimetics, Nanomaterials and Thin Films, Advanced Materials Processing and Characterization, Biofluids and Biosensors, Microelectronic Thermal Management and Heat Transfer, and Compliant Mechanisms.

**ADMISSION INFORMATION**

Must meet University requirements (see Graduate Admissions) as well as requirements for admission to the major, listed below.

* As a rule, only students with a B.S. in Mechanical Engineering or a closely related field from an accredited engineering major will be considered for admission.
* All applicants must take the GRE.
* GRE required, with minimum percentile rank of 50% on the quantitative portion and a minimum average percentile rank of 50% in verbal and quantitative and the student must have a grade point average (GPA) of 3.00/4.00 for the last two years of coursework from an ABET accredited engineering major for admission to the Master’s Major. Graduates of non-ABET accredited majors are evaluated on a case-by-case basis.
* A one-page Statement of Purpose/Research Interest must also be included in the application package.

**CURRICULUM REQUIREMENTS**

**Total Minimum Hours: 30 credit hours**

**Core – 12 credit hours**

**Additional courses – 18 credit hours**

**Core Requirements – 12 credit hours**

Specialization – 9 hours

All Master’s Major students must complete a total of 9 core credit hours from two categories. Students should choose 3 credit hours of course work from each of the following specialization areas:

# Fluid and Thermal Science - 3 credit hours

EML 6105: Advanced Thermodynamics and Statistical Mechanics

EML 6154: Advanced Conduction Analysis

EML 6713: Advanced Fluid Mechanics

EML 6930: Special Problems I: Convection Heat Transfer

# Mechanics, Manufacturing, and Materials -3 credit hours

EML 6653: Applied Elasticity

EML 6930: Special Problems I: Advanced Manufacturing

EML 6930: Special Problems I: Advanced Materials

EML 6570: Fracture Mechanics

EML 6290: Micro and Nano Manufacturing

# Dynamical Systems and Controls - 3 credit hours

EML 6273: Advanced Dynamics of Machinery

EML 6930: Special Problems I: Advanced Controls

EML 6930: Special Problems I: Advanced Vibrations

EML 6801: Robotic Systems

All students must also complete either

EML 6931: Special Problems II: Advanced Mathematics or

EML 6930: Special Problems I: Advanced Mathematics II in order to satisfy core requirements.

**Additional Coursework - 18 credit hours**

In addition to these 12 credit hours, the non-thesis option MSME degree requires a minimum of 18 credit hours of approved graduate level coursework, for a total of 30 semester hours. Thesis option M.S.M.E. degree requires 12 credit hours of approved graduate level coursework and a minimum of 6 thesis hours for a total of 30 semester hours.

**Comprehensive Exam**

For the thesis option, successful defense of the thesis satisfies the comprehensive exam requirement.

For the non-thesis option, in lieu of the comprehensive exam, a portfolio containing project reports submitted as part of the coursework requirement for two out of three specialization areas will be submitted to the Department upon application of graduation. The Graduate Coordinator and Graduate Committee members of the Department will evaluate the portfolio.

**Thesis Option- 6 credit hours**

EML 6971 Thesis: Master’s

Thesis option M.S.M.E. degree reuqies a minimum of 6 thesis hours. Thesis option

The Department of Mechanical Engineering has available, on request, the Mechanical Engineering Graduate Handbook, which delineates the Department’s entrance requirements, programs of study, supervisory committee formation, and major completion requirements.

**Accelerated B.S.M.E. in Mechanical Engineering and M.S.M.E. in Mechanical Engineering**

**Description**

Students pursuing a B.S.M.E. in Mechanical Engineering will earn an M.S.M.E. in Mechanical Engineering in an accelerated manner by sharing two (2) core graduate courses (6 credit hours) taken as upper-level departmental electives as part of the undergraduate Mechanical Engineering major.

The B.S.M.E. requires a total of 128 hours and the M.S.M.E. requires 30 hours. By sharing six (6) credit hours, the total credit hours earned will be 152 hours.

This accelerated major shares six (6) credit hours between already existing degrees:

B.S.M.E. in Mechanical Engineering

M.S.M.E. in Mechanical Engineering

Target Students and Expected Outcomes

Academically high achieving undergraduate students in the B.S.M.E. major with high overall and major GPA will be targeted for the accelerated major. Expected outcomes are the increase in M.S.M.E. degrees granted, increase in graduate SCH, and enhancement of the quality of the graduate major by addition of academically accomplished

students.

Admission Requirements

For admission to the program, a student must:

1. Have completed 15 hours in the undergraduate major
2. Have a minimum 3.33 GPA overall; and
3. Have a minimum undergraduate 3.50 GPA in the major.

Timeline and Benchmarks:

1. To be considered for acceptance into the Accelerated B.S.M.E. in Mechanical Engineering/M.S.M.E. in Mechanical Engineering major, students must have completed a minimum of 15 credit hours in the Mechanical Engineering undergraduate major.
2. Students must have a minimum undergraduate GPA of 3.33 overall, and a minimum GPA of 3.50 in the Mechanical Engineering major.
3. Following completion of a minimum of 15 hours in the undergraduate major, students may be considered for acceptance into the accelerated major through faculty nomination or student self-nomination, via submission of an Accelerated major Application Form. Both B.S.M.E. and M.S.M.E. majors will review the applications and approve the nominations. All applications require the approval of USF’s Office of Graduate Studies, the College of Engineering’s Graduate Major, and the Department of Mechanical Engineering.
4. To be promoted to graduate status, students must meet all admission requirements of the M.S.M.E. in Mechanical Engineering.
5. Students must earn a minimum of a “B” (3.00) in all shared graduate courses. Failure to earn at least a “B” in a shared graduate course will result in academic review by the graduate major. Failure to maintain good standing as a graduate student will result in academic probation, according to the procedures of the USF Office of Graduate Studies.
6. A comprehensive plan of study to complete the Accelerated B.S.M.E. in Mechanical Engineering/M.S.M.E. in Mechanical Engineering major will be developed with the guidance of an advisor and a faculty member.

**Shared Courses (6 credit hours)**

The following courses will satisfy six (6) credit hours of Mechanical Engineering elective coursework:

EML 6653 Applied Elasticity

EML 6713 Advanced Fluid Mechanics

Undergraduate Degree Requirements for the B.S.M.E. in Mechanical Engineering (107 credit hours)

\*Please see Undergraduate Catalog for major-specific requirements

**COURSES**

 See [http://ugs.usf.edu/course-inventory](http://www.ugs.usf.edu/sab/sabs.cfm)