

# COLLEGE OF ENGINEERING

UNIVERSITY OF SOUTH FLORIDA 2017-2018 UNDERGRADUATE CATALOG

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

### **Description**

Students pursuing a B.S.M.E. in Mechanical Engineering will earn an M.S.E.M. in Engineering Management in an accelerated manner by sharing two (2) 6000-level EIN or ESI 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.E.M. requires 30 hours. By sharing six (6) credit hours, the total credit hours earned will be 152 hours.

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

- B.S.M.E. in Mechanical Engineering
- M.S.E.M. in Engineering Management

### **Target Students and Expected Outcomes**

Academically high achieving undergraduate students in the B.S.M.E. program with high overall and major GPA will be targeted for the accelerated program. Expected outcomes are that the increase in M.S.E.M. degrees granted, increase in graduate SCH, and enhancement of the quality of the graduate program 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.E.M. in Engineering Management program, 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 program through faculty nomination or student self-nomination, via submission of an *Accelerated Program Application Form*. Both B.S.M.E. and M.S.E.M. 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 Program, and Department of Mechanical Engineering's Undergraduate Program, and the Department of Industrial and Management System Engineering's Graduate Program.
4. To be promoted to graduate status, students must meet all admission requirements of the M.S.E.M. in Materials Science and 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 program. 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.E.M. in Engineering Management program 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:

Two (2) EIN or ESI courses at the 6000-level to count toward the Upper-Level Technical Design electives

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

**\*Please see Undergraduate Catalog for major-specific requirements**

### **Major Core (95 credit hours)**

#### **Math and Science (27 credit hours)**

- MAC 2281 Engineering Calculus I or MAC 2311 Calculus I
- MAC 2282 Engineering Calculus II or MAC 2312 Calculus II
- MAC 2283 Engineering Calculus III or MAC 2313 Calculus III
- MAP 2302 Differential Equations

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CHS 2440 General Chemistry for Engineers or CHM 2045 General Chemistry I  
CHS 2440L General Chemistry for Engineers Laboratory or CHM 2045 General Chemistry I Laboratory  
PHY 2048 General Physics I  
PHY 2048L General Physics I Laboratory  
PHY 2049 General Physics II  
PHY 2049L General Physics II Laboratory

## **Basic Engineering (22 credit hours)**

EGN 3000 Foundations of Engineering  
EGN 3000L Foundations of Engineering Laboratory  
EGN 3311 Statics  
EGN 3321 Dynamics  
EGN 3615 Engineering Economics with Social and Global Implications  
EGN 3365 Materials Engineering I  
EGN 3373 Introduction to Electrical Systems I  
EGN 3343 Thermodynamics I  
EGN 3443 Probability & Statistics for Engineers

## **Specialization (43 credit hours)**

EML 3035 Programming Concepts for Mechanical Engineers  
EML 3500 Mechanics of Solids  
EML 3022 Computer Aided Design and Engineering (CAD)  
EML 3041 Computational Methods  
EML 3262 Kinematics and Dynamics of Machinery  
EML 3701 Fluid Systems  
EML 4325 Mechanical Manufacturing Processes  
EML 3303 Mechanical Engineering Lab I  
EML 4123 Heat Transfer  
EML 4501 Machine Design  
EML 4106C Thermal Systems and Economics  
EML 4220 Vibrations  
EML 4302 Mechanical Engineering Laboratory II  
EML 4312 Mechanical Controls  
EML 4551 Capstone Design (CPST)

## **Technical Writing (3 credit hours)**

ENC 3246 Communication for Engineers (WRIN)

## **Major Electives (12 credit hours)**

12 hours of Upper-Level Departmental Electives (Technical Design Elective) from the list below:

BME 4332 Cell and Tissue Engineering  
BME 4440 Introduction to Bioastronautics  
EAS 4121 Hydro and Aerodynamics  
EGN 4366 Materials Engineering II  
EML 4141 Thermal Management of Electronic Systems  
EML 4230 Introduction to Composite Materials  
EML 4246 Tribology  
EML 4310 Microcontrollers  
EML 4326 Advanced Materials Processing  
EML 4414 Power Plant Engineering  
EML 4419 Propulsion I  
EML 4421 Internal Combustion Engines  
EML 4450 Alternative & Renewable Energy  
EML 4503 Sustainable Design and Materials  
EML 4552 Senior Mechanical Design  
EML 4575 Principles of Fracture Mechanics  
EML 4593 Haptics  
EML 4601 Air Conditioning Design  
EML 4702 Fluid Dynamics II  
EML 4703 Mechanics of Compressible Fluids  
EML 4905 Independent Study  
EML 4930 Special Topics in Mechanical Engineering  
OSE 4601 Optical Product Technology

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## **Shared Courses (6 credit hours)**

The following courses will satisfy six (6) credit hours of Mechanical Engineering elective coursework:  
Two (2) EIN or ESI courses at the 6000-level to count toward the Upper-Level Technical Design electives

## **Graduate Degree Requirements for the M.S.E.M. in Engineering Management (30 Credit Hours)**

**\*Please see Graduate Catalog for major-specific requirements**

### **Major Core (18 credit hours)**

#### **General Core Area - 12 credit hours**

EIN 5182 Principles of Engineering Management  
EIN 5350 Technology and Finance  
EIN 6183 Engineering Management Policy & Strategy  
EIN 6386 Management of Technological Change

#### **Quantitative Core Area - 3 credit hours**

Three (3) credit hours must be selected from the following options, as approved by advisor.  
ESI 5219 Statistical Methods for Engineering Managers  
ESI 5306 Operations Research for Engineering Managers  
ESI 6247 Statistical Design Models

#### **Job Design Core Area - 3 credit hours**

Three (3) credit hours must be selected from the following options, as approved by advisor.  
EIN 6108 Engineering Management: Human Relations  
EIN 6319 Work Design, Motivation & Productivity

### **Major Electives (12 credit hours)**

Twelve (12) credit hours minimum must be selected from the following options, as approved by advisor.

EIN 5174 Total Quality Management (TQM) Concepts  
EIN 5201 Creativity in Technology  
EIN 5510 Manufacturing Systems Analysis  
EIN 6106 Technology and Law  
EIN 6112 Information Systems Design for Engineering  
EIN 6145 Project Management  
EIN 6178 ISO 9000/14000  
EIN 6154 Technical Entrepreneurship  
EIN 6215 Systems Safety Engineering  
EIN 6216 Occupation Safety Engineering  
EIN 6217 Construction Safety Engineering  
EIN 6275 Design Controls for Medical Devices  
EIN 6324 Engineering the Supply Chain  
EIN 6336 Production Control Systems  
EIN 6392 New Product Development  
EIN 6420 Non-Linear Programming  
EIN 6430 Overview of Regulated Industries  
EIN 6431 Regulatory Quality Systems & Controls for Medical Devices  
EIN 6432 Regulated Product Approval Process  
EIN 6433 Human Factors Engineering in Medical Devices  
EIN 6435 International Regulations for Medical Devices  
EIN 6934 Systems Integration  
EIN 6935 Lean Six Sigma  
EIN 6936 Advanced Lean Six Sigma  
ESI 5236 Reliability Engineering  
ESI 5522 Computer Simulation  
ESI 6213 Stochastic Decision Models I  
ESI 6448 Integer Programming  
ESI 6491 Linear Programming & Network Optimization

### **Thesis Option - 6 hours minimum**

#### **EIN 6971 Thesis**

A thesis option is available to M.S.E.M. students who are interested in applied research. In the thesis option, 18 hours of core coursework, 6 hours of electives, and 6 hours of thesis are the minimum requirements. Students in the Thesis option are required to have a Thesis Defense.