

COLLEGE OF ENGINEERING

UNIVERSITY OF SOUTH FLORIDA 2017-2018 UNDERGRADUATE CATALOG

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

Description

Students pursuing a B.S.M.E. in Mechanical Engineering will earn an M.S.B.E. in Biomedical 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.B.E. 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.B.E. in Biomedical Engineering

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 the increase in M.S.B.E. 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.B.E. in Biomedical Engineering 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 Mechanical Engineering the 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.B.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 Program, the Department of Mechanical Engineering's Undergraduate Program, and the Department of Chemical and Biomedical Engineering's Graduate Program.
4. To be promoted to graduate status, students must meet all admission requirements of the M.S.B.E. in Biomedical 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.B.E. in Biomedical Engineering program will be developed with the guidance of an advisor and a faculty member.

Shared Courses (6 credit hours)

Two (2) of the following five (5) core graduate courses replace six (6) credit hours of upper-level departmental electives in Mechanical Engineering:

- BME 6000 Biomedical Engineering I
- BME 6931 Biomedical Engineering II
- GMS 6440 Basic Medical Physiology or BME 6409 Engineering Physiology
- GMS 6605 Basic Medical Anatomy
- PHC 6051 Biostatistics II

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

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MAC 2282 Engineering Calculus II or MAC 2312 Calculus II
MAC 2283 Engineering Calculus III or MAC 2313 Calculus III
MAP 2302 Differential Equations
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

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EML 4930 Special Topics in Mechanical Engineering
OSE 4601 Optical Product Technology

Shared Courses (6 credit hours)

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BME 6000 Biomedical Engineering I
BME 6931 Biomedical Engineering II
GMS 6440 Basic Medical Physiology or BME 6409 Engineering Physiology
GMS 6605 Basic Medical Anatomy
PHC 6051 Biostatistics II

Graduate Degree Requirements for the M.S.B.E. in Biomedical Engineering (30 Credit Hours)

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

Major Core (15 credit hours)

BME 6000 Biomedical Engineering I
BME 6931 Biomedical Engineering II
GMS 6440 Basic Medical Physiology or BME 6409 Engineering Physiology
GMS 6605 Basic Medical Anatomy
PHC 6051 Biostatistics II

Major Electives (15 credit hours)

Students select from additional approved courses to complete the 30 credit hour requirement. A minimum of 16 credit hours must be at the 6000-level. In addition, all of the elective courses must consist of engineering-prefix courses, although the Thesis Committee (thesis option) or the BME Program Advisor (non-thesis option) may approve courses in relevant areas such as chemistry, physics, pharmacy, communication sciences and disorders, public health, or medicine, in their place.

Thesis Option

Thesis option students can count up to six (6) credit hours of thesis research towards the elective requirements.

Comprehensive Exam

Students in the non-thesis track will complete a comprehensive exam. For students in the thesis track, the thesis and oral defense serve as the comprehensive exam.