**Biomedical Engineering program**

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

**DEGREE INFORMATION**

**Program Admission Deadlines:**

**Fall:** February 15

**Spring:**  October 15 (Sept 15 – Int’l)

**Summer:**  February 15 (Jan 15 – Int’l)

**Minimum Total Hours:** 30

**Program Level:** Masters

**CIP Code:** 14.0501

**Dept. Code:** DEA

**Program (Major/College):** EBI EN

**Approved:** 1999

**Concentrations:**

**Pharmacy**

**CONTACT INFORMATION**

**College:** Engineering

**Department:** Chemical & Biomedical Engineering

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

**PROGRAM INFORMATION**

Biomedical Engineering is a highly interdisciplinary program that combines engineering and the medical sciences. The student works with an advisor to develop a graduate program that draws on courses from engineering, medicine, public health, and the life sciences. Current active areas of research include: biomechanics, biomaterials, medical imaging, neuroengineering, tissue engineering, sensors, cellular-level drug delivery, and rehabilitation engineering. In addition to USF Health, participating institutions include the James Haley Veterans Administration Hospital, Florida Orthopedics Institute, and Tampa General Hospital. For more information, please contact the BME Program Advisor.

**Accreditation:**

Accredited by the Commission on Colleges of the Southern Association of College and Schools.

**Major Research Areas: Biomechanics, Biomaterials,** Neuroengineering, Photo Sensors, Cellular-level drug discovery and Tissue Engineering

**ADMISSION INFORMATION**

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

**Program Admission Requirements**

* Undergraduate GPA of 3.00 or higher;
* GRE with preferred Minimum scores of Quantitative >75% and Analytical Writing 4 or >;
* An undergraduate Bachelor’s degree in Engineering or Science;
* Two (2) letters of recommendation
* A statement of purpose
* CV
* Applicants from countries where English is not the official language must demonstrate proficiency in English. See the Admissions Policy section of the Graduate Catalog for approved ways of demonstrating proficiency http://www.grad.usf.edu/inc/linked-files/Catalog%20and%20Policies/2014\_2015/Section\_4\_Admissions.pdf

**Notes:** Exceptionally qualified students with bachelor’s degrees in the Life and Physical Sciences may be admitted into the BME M.S. Program. Such students will typically have to complete a series of pre-requisite engineering and calculus courses before formal admission into the program. Any pre-requisite courses will normally not count towards the degree requirements. The BME Program Director should be consulted for details.

**Pre-requisite courses include:**

MAC 2281            Engineering Calculus I

MAC 2282            Engineering Calculus II

MAC 2283            Engineering Calculus III

EGN 3433             Modeling and analysis of engineering systems

Students must complete 12 hours minimum from the following courses:

                                \*EGN 3311          Statics

                                EGN 3321             Dynamics

                                EGN 3331             Mechanics of Materials

                                EGN 3365             Materials Engineering I

                                \*EGN 3373          Electrical Systems I

                                \*EGN 3343          Thermodynamics

                                ECH 3702              Instrument Systems I

                                EML 3701             Fluid Systems

Students should note that EGN 3311 is a prerequisite for several of the listed courses.

\*Indicate most highly recommended courses

This degree does not require an undergraduate degree in engineering or pharmacy. Complete background courses in Chemical/Biomedical Engineering as needed.

**DEGREE PROGRAM REQUIREMENTS**

**Total Minimum Program Hours: 30 credit hours**

**Both the thesis and non-thesis options are available at the M.S. level.**

**Core Requirements – 15 hours**

Currently there are five (5) required courses:

GMS 6440 (3) Basic Medical Physiology or BME 6931 (3) Engineering Physiology

GMS 6605 (3) Basic Medical Anatomy

PHC 6051 (3) Biostatistics II

BME 6000 (3) Biomedical Engineering I

BME 6931 (3) Biomedical Engineering II

Students may either opt for the Concentration in Pharmacy or follow the general track completing 15 hours of electives as noted:

**Concentration in Pharmacy – 15 hours in lieu of electives**

Students select from the following options, or other pharmacy course, as apprpoved by their Pharmacy and BME Advisors.

Examples of courses are provided below. Courses without numbers are under development/approval. Other courses may be added later.

PHA 6140 3 Introduction to Nanotechnology (Online)

PHA 6116 3 Micro-Nano Drug Delivery systems (Online)

PHA 6118 3 Nanomaterials and BioMEMs (Online)

PHA XXXX 3 Nanotechnology and Risk Management (Online)

PHA XXXX 3 Nanoformulations and nanopharmacutics (Online)

PHA 6788 3 Introduction to personalized medicine (Online)

**General Track Electives – 15 hours**

Students select from additional approved courses to complete the 30 hour requirement. A minimum of 16 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, Communications sciences & disorders, public health or medicine, in their place.

**Thesis Option – 6 hours**

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

**Comprehensive Exam**

**COURSES**

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