**Biomedical Engineering program**

**Doctor of Philosophy (Ph.D.) Degree**

**DEGREE INFORMATION**

**Program Admission Deadlines:**

**Fall:** February 15

**Spring:**  October 15

**Summer:**  February 15

**Minimum Total Hours: 60 post-master’s**

90 post-bachelor’s

**Program Level:** Doctoral

**CIP Code:** 14.0501

**Dept. Code:** ECH

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

**Approved:** 2005

**CONTACT INFORMATION**

**College:** Engineering

**Department:** Chemical & Biomedical Engineering

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

**PROGRAM INFORMATION**

The Ph.D. in Biomedical Engineering at the University of South Florida prepares individuals to contribute in this highly interdisciplinary field both as individuals and as members of interdisciplinary teams. Graduates are prepared to solve complex problems in areas such as diagnostic instrumentation, artificial organs, prosthetic devices, rehabilitation, and health care system design and operations, biomechanics, biomaterials, imaging, neuroengineering, tissue engineering, sensors, cellular‐level drug delivery. The doctoral program capitalizes on USF's strong programs in Engineering and in the Health Sciences as well as the contiguously located H. Lee. Moffitt Cancer Center and Research Institute, and the James Haley Veterans Administration Hospital.

Students in the program may choose to concentrate in one of several nationally recognized areas of Biomedical Engineering strength at USF including:

* Medical Imaging
* Rehabilitation Engineering
* Biomechanics and Biomaterials
* Molecular, Cellular and Tissue Engineering
* Drug and Gene Delivery
* Neuroengineering
* Photonics and Diagnostic Engineering

The Biomedical Engineering Program at USF provides students with an integrated knowledge of engineering, biomedical science and other appropriate disciplines to allow participation in and advancement of the interdisciplinary field of Biomedical Engineering. The program also facilitates biomedical engineering research at USF through interactions with USF faculty and with industry and other health care institutions and catalyzes the growth of biomedical product companies throughout the region by the development, dissemination, and commercialization of new biomedical technologies. Overall, the program strives to develop and promote technologies and processes that will lead to better health care and improved quality of life.

**Accreditation:**

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

**Major Research Areas:** Neuroengineering, biomechanics, biomaterials, medical imaging, sensors, cellular-level drug delivery, and rehabilitation engineering and tissue engineering

**ADMISSION INFORMATION**

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

**Program Admission Requirements**

Successful applicants to the Ph.D. degree program in biomedical engineering will typically have presented the following preferred qualifications:

* GRE required with preferred scores: Verbal >50% percentile and Quantitative > 75th percentile and Analytical Writing > 4.0.
* An undergraduate GPA of >3.50 (out of a possible 4.00) based on official transcripts.
* Completion of a Master's degree in biomedical engineering or a related field.
* Evidence of sustained interest in biomedical engineering.
* A statement of purpose and CV.
* Three (3) Letters of recommendation.

Note: Admissions decisions will be made using multiple measures indicated above. We strongly encourage applicants to contact specific faculty conducting research related to the student’s interests. Such direct contact with individual faculty members can greatly strengthen an application.

**DEGREE PROGRAM REQUIREMENTS**

**Total Minimum Hours: 90 hours**

For students with an *approved* master’s degree 60 hours minimum post-master’s

For students without a master’s degree 90 hours minimum post-bachelor’s

**Core courses – 15 hours**

**Specialization courses – 15 hours**

**Additional Electives or Directed Research for students without a master’s degree – 30 hours**

**Dissertation – 30 hours**

**Core Courses:**

A minimum of 15 credits including:

GMS 6440 3 Basic Medical Physiology OR

BME 6410 3 Engineering Physiology

GMS 6605 3 Basic Medical Anatomy

PHC 6051 3 Biostatistics II

BME 6000 3 Biomedical Engineering

BME 6931 3 Selected Topics in Biomedical Engineering: Biomedical Engineering II

**Specialization Courses:**

A minimum of 15 graduate credit hours selected from one of these areas of specialization. Directed Research courses in these areas can count as a part of these credits:

*-Medical Imaging*

*-Rehabilitation Engineering*

*-Biomechanics and Biomaterials*

*-Cardiovascular Engineering*

*-Neuroengineering*

*-Tissue Engineering*

**Qualifying Exam**

Ph.D. Qualifying Examination, preferably to be completed by the end of the second year of study. The dissertation committee will evaluate a written dissertation proposal and an oral defense. Poor performance on the qualifying exam based on the judgment of the Committee may result in the student failing the exam. If a student does not pass on the first attempt, he/she may request in writing to repeat the Exam. Students who fail the Qualifying Examination the second time will be dismissed by the Program.

**Dissertation (30 hours)**

BME 7980 – Ph.D. Dissertation

30 credits of dissertation research are required. 6 hours of Directed Research may be substituted for 6 Dissertation hours. As with other engineering Ph.D. degrees, evidence of the significance of the conducted research is provided by publication in appropriate refereed journals; with a minimum of 1 publication in a peer-reviewed journal, with the student as primary author. The expectation is that Ph.D. students will have 3 or more publications. The required journal publication must be based on your Dissertation research. Presentation at a conference or publication in a proceeding (even if refereed) is not sufficient.

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**OTHER INFORMATION**

**Graduate Assistantships and Fellowships**

Financially competitive teaching and research graduate assistantships and fellowships will be offered to incoming students. Of special importance are the research opportunities and support available through affiliated institutions including the H. Lee Moffitt Cancer Center and Research Institute, the James Haley VA Hospital. In addition, particularly outstanding applicants will be nominated for university fellowships including Presidential Fellowships which provide competitive stipends plus tuition, fees and Health Insurance renewable for five years.

**Results**

Doctoral graduates of this program have been prepared for and are successfully engaged in research careers in Government, Corporate, and University Laboratories. In addition, since much of Biomedical Engineering research translates directly into biomedical devices, drugs, and instrumentation, graduates have also been directly involved in technology transfer, including the establishment of new Biomedical Engineering related businesses.

**Graduate Certificates**

As a valuable complement to graduate training in Biomedical Engineering, students are encouraged to also consider earning a graduate certificate particularly in the areas of:

Aging and Neuroscience

Biochemistry and Molecular Biology

Bioinformatics

Biostatistics

Biotechnology

Clinical Epidemiology

Entrepreneurship

Health Management and Leadership

Infection Control

Materials Science & Engineering

Regulatory Affairs – Medical Devices.

Technology Management

Total Quality Management

**COURSES**

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