Curriculum

The Curriculum is structured in three modules:

Module 1. Biomedical Engineering Foundation 12 Semester Credit Hours

This module is required for all biomedical engineering students and is designed to provide the background necessary for all areas of specialization offered by the program. The module consists of six hours of analytical foundation and six hours of science foundation. The analytical foundation consists of the following courses:

BME 501 Statistics for Biomedical Engineers 3 hours
ENGR 521 Probability and Random Variables 3 hours

All engineering majors and most, if not all, science majors have the background necessary to enroll in these courses. Students that do not have the prerequisite knowledge to enroll in these courses may be admitted to the program with the requirement to take additional mathematics background courses.

The science foundation requires at least six hours selected from the following courses offered by the Departments of Physiology, Chemistry and Biochemistry.

PHSL 410A Mammalian Physiology	4 hours
PHSL 410B Mammalian Physiology	4 hours
CHEM 444 Intermediate Organic Chemistry	3 hours
CHEM 451 Biochemistry	3 hours

The selection of the science courses must be approved by the program coordinator based on the student's academic background and desired area of specialization. The courses above are expected to be selected most of the time, however, (with the approval of the program coordinator) students may select other science courses that better complement their background or better serve their area of interest. The requirement for six hours of science will be waived for students with Bachelor of Science degree in Biomedical Engineering, however, these students will be expected to take three hours of additional engineering courses to meet the requirements of the Graduate School for MS degrees.

Module 2. Biomedical Engineering Concentration 12 Semester Credit Hours

This Module includes the 500-level BME courses and 500-level courses related to biomedical engineering, offered by different units on campus (referred to as BME-related courses).

The areas of concentration are as follows:

- Bioinformatics & Computational Medicine
- Modeling and Simulation of Biomedical Processes

• Biomedical Imaging
• Biomedical Instrumentation
• Biomechanics and Biomaterials

The list of BME courses is shown in our webpage

http://www.engr.siu.edu/biomed/

The students, normally, are expected to select all twelve hours from one of the concentrations. With the approval of their advisor, however, students may select nine hours from the concentration only, and three hours as a free elective. Finally, with the approval of the Program Coordinator, students may select any combination of courses, depending on their background or their specific interests. In all cases, however, at least six hours must always be selected from BME courses.

Module 3. Biomedical Research or Capstone Design 9 Semester Credit hours

Master of Science Option (M.S.)

For the students seeking a Master of Science Degree in Biomedical Engineering, this module consists of the following:

BME 599 Thesis 6 hours
BME 598 Biomedical Engineering Seminar 2 hours
BME 597 Biomedical Research Ethics 1 hour

All requirements and regulations regarding the Thesis (as is the case with all the other Master's degrees in traditional engineering disciplines) will be consistent with the relevant policies and procedures of the Graduate School published in the graduate catalog. One hour of Biomedical Engineering Seminar BME 598 must be taken in the first semester of study. Thus, students with BS degrees in traditional engineering disciplines or computer science are expected to complete the requirements of the program with thirty-three hours. Students with BS degree in biomedical engineering will require thirty hours. For students with BS degrees in other than engineering disciplines, it is possible that more than thirty three hours will be needed, depending on the background and interests of the student. This will be assessed, for each student individually, at the time of admission.

Master of Engineering Option (M.E.)

For the students seeking a Master of Engineering Degree in Biomedical Engineering, this Module consists of the following:

BME 592 Capstone Design 3 hours
BME 598 Biomedical Engineering Seminar 2 hours
BME 597 Biomedical Research Ethics 1 hour
Approved Elective Course 3 hours

BME 592, Capstone Design, must involve substantial design in a biomedical engineering field and must be concluded with a technical report. The report both in terms of technical content and presentation must be approved by a three member faculty committee appointed and chaired by the faculty member who directed the project. One hour of Biomedical Engineering Seminar BME 598 must be taken in the first semester of study. For students with BS in engineering the Elective Course must be at the 500-level if an Engineering course, otherwise it could be at the 400-level. For students with BS in Science the Elective Course must be at the 500-level if a science course, otherwise it could be at the 400-level. In any event, the Elective Course must be approved by the program coordinator. Thus, students with BS degrees in traditional engineering disciplines or computer science are expected to complete the requirements of the program with thirty-three hours. Students with BS degree in biomedical engineering will require thirty hours. For students with BS degrees in other than engineering disciplines, it is possible that more than thirty three hours will be needed, depending on the background and interests of the student. This will be assessed, for each student individually, at the time of admission.