Emphasis - Biomolecular

B.S.B.E. in Biomedical Engineering

Description

The Bachelor of Science in Biomedical Engineering (B.S.B.E.) degree program will prepare engineering students at the University of Mississippi to capably apply advanced mathematics, science, and engineering to solve the problems at the interface of engineering, biology, and medicine. Moreover, the curriculum will prepare graduates with the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

The graduates of the program will be able to pursue (i) employment in biomedical or related industries (ii) graduate studies in biomedical engineering or related disciplines, and (iii) pursue professional careers in medicine, dentistry, pharmacy, or patent law.

Program Educational Objectives

Following graduation and during the first several postgraduate years, biomedical engineering baccalaureate degree holders from the University of Mississippi will possess skill sets to accomplish the following:

1. Meet evolving expectations of future employers in the biomedical engineering workplace as well as other professional careers
2. Exhibit a systematic approach to problem solving in their professional practice including quantitative and analytical skills weighted with considerations towards a sustainable future.
3. Continue their professional development by pursuing advanced studies in medicine and other professional fields if desired.

Student Outcomes

Biomedical engineering students at the University of Mississippi should demonstrate the attainment of the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Minimum Total Credit Hours: 127

General Education Requirements

For detailed information see the the General Education Requirements of the School of Engineering.

Fifteen Credits of Liberal Arts:

Students must complete at least 6 credit hours in the social and behavioral sciences, at least 6 credit hours from humanities, and at least 3 credit hours from fine and performing arts appreciation.

For the purpose of these requirements:

Social/behavioral sciences

Social/behavioral sciences will include anthropology (Anth), economics (Econ), liberal arts (Liba 203, Liba 313), political science (Pol), psychology (Psy), sociology (Soc), and either Hon 101 or Hon 102 (if not being used to fulfill composition requirements)..

Humanities

Humanities will include African American studies (Aas 201, 202), classics (Clc), English (Eng 220-226), gender studies (G St 201, 202), history (Hst), liberal arts (Liba 202, 305, 312), philosophy (Phil), religion (Rel), Southern studies (S St 100-level), and either Hon 101 or 102 (if not being used to fulfill composition requirements).

Fine and performing arts apprecation

Fine and performating arts appreciation will include courses in art history (AH), liberal arts (Liba 130, 204, 314), music (Mus 101-105), and theatre & film (Thea 201, 202; Danc 200).

Course Requirements

Specific requirements for the B.S.B.E. include Writ 100, Writ 101, or Hon 101; Writ 102, Liba 102, or Hon 102; Engr 101, 111; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 225; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 256 or BME 256; Engr 360; BME 200, 222, 305, 311, 313, 314, 315, 333, 370, 400, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course (up to 3 hours) in engineering. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.

Emphasis - Biomolecular

Description

Biomolecular Engineering is an emerging discipline at the interface of molecular biology, biophysical chemistry, and chemical engineering — whose express purpose is developing novel molecular tools, materials, and approaches that are the focal point of applied and basic research within academia, industry, and medicine.

Course Requirements

Specific requirements for the biomolecular emphasis include:

- BME 256
- Bisc 333
- BME 520
- Choose two BME courses (6 hours) from BME 510, 522, 523, 524.
- Choose three emphasis courses (9 hours) from Bisc 306, 310, 336, 440; Ch E 535, 540, 543, 550; Chem 222 and 471. Any BME 300 level or higher course. Chem 222 and Chem 471 are a required pairing to count as emphasis courses.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may take an independent research course for departmental credit (300 level or higher, 3 hours) to count as an emphasis course. Additional opportunities for research in chemistry, biology, physics, or pharmacy may be approved with permission of the BME chair.