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: 126

General Education Requirements

Students must complete at least 18 semester hours of general education requirements: 3 hours in humanities, 3 hours in fine arts, 3 hours in humanities/fine arts, 6 hours in social science (including Econ 310), and the remaining 3 hours can be in any of the humanities/fine arts, social science, or general education courses as specified by the School of Engineering.

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; Math 261-264, Math 353; Chem 105, 106, 115, 116, 221, 222, 225, 226; Phys 211, 212, 221, 222; Bisc 160, 161, 162, 163; Csci 251; Engr 360, 400; El E 331; Ch E 307, 308; BME 200, 222, 313, 314, 333, 370, 444, 461, 462.

Other Academic Requirements

Students in the Department of Biomedical Engineering who consider independent research as part of their educational experience may use up to 3 hours of Engr 300 or above course or independent research course housed in chemistry, biology or physics as an emphasis elective in the biomolecular and bioinformatics emphases.

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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 Bisc 336; Ch E 520; BME 320, 510; 6 hours of emphasis electives chosen from Bisc, Chem, Math, Phys, or School of Engineering 300 level or above or special courses with departmental approval.

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and

graduation; and 3) change other regulations affecting the student body at any time.

B.S.B.E. in Biomedical Engineering

General Education

REQUIREMENT	HOURS	DESCRIPTION
First Year Writing I	3	Successfully complete Hon 101, Writ 100, or Writ 101 with a passing grade.
First Year Writing II	3	Successfully complete one of the following courses with a passing grade: Writ 102, Liba 102, Hon 102.
3 hrs social sciences	3	Complete 3 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.
Econ 310	3	Successfully complete Econ 310 with a passing grade.
3 hrs humanities	3	Complete 3 hrs of humanities choosing from course work in classics, literature, history, modern language, philosophy, religion, Southern studies, African American Studies, Gender Studies, and Southern Studies.
3 hrs fine arts	3	Student must successfully complete 3 hours in the fine arts. The course may be chosen from art history, art appreciation, and criticism of art, dance, music, and theatre arts. Courses emphasizing the enhancement of skills and performance are not acceptable.
3 hrs fine arts/humanities	3	Complete 3 additional hours in any of the humanities or fine arts categories defined by the School of Engineering general education requirements.
3 hrs GenEd, SS, Hum or FA	3	Complete 3 hrs General Education work chosen from the following: additional fine art, additional social science, additional humanities, As 301, As 302, Bus 250, Bus 271, Edld 110, Edld 111, Edld 120, Edld 220, Engr 400, Mgmt 371, Msl 102, Nsc 211, Spch 102, or Spch 105.
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.

Major Requirements

REQUIREMENT	HOURS	DESCRIPTION
BME 200	2	Complete BME 200 with a passing grade.
BME 222	3	Complete BME 222 with a passing grade.
BME 313	3	Complete BME 313 with a passing grade.
BME 314	1	Complete BME 314 with a passing grade.
BME 333	3	Complete BME 333 with a passing grade.
BME 370	3	Complete BME 370 with a passing grade.
BME 444	3	Complete BME 444 with a passing grade.
BME 461	2	Complete BME 461 with a passing grade.
BME 462	2	Complete BME 462 with a passing grade.
Bisc 160	3	Complete Bisc 160 with a passing grade.
Bisc 161	1	Complete Bisc 161 with a passing grade.
Bisc 162	3	Complete Bisc 162 with a passing grade.
Bisc 163	1	Complete Bisc 163 with a passing grade.
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.

REQUIREMENT	HOURS	DESCRIPTION
Chem 222	3	Complete Chem 222 with a passing grade.
Chem 225	1	Complete Chem 225 with a passing grade.
Chem 226	1	Complete Chem 226 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Csci 251	3	Complete Csci 251 with a passing grade.
El E 331	3	Complete El E 331 with a passing grade.
Engr 360	3	Complete Engr 360 with a passing grade.
Engr 400	1	Complete Engr 400 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.

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REQUIREMENT	HOURS	DESCRIPTION
Bisc 336	4	Complete Bisc 336 with a passing grade.
BME 320	3	Complete BME 320 with a passing grade.
BME 510	3	Complete BME 510 with a passing grade.
Ch E 520	3	Complete Ch E 520 with a passing grade.
6 hrs track electives	6	Complete 6 hrs of track electives with a passing grade.