

## Emphasis - Biomedical Engineering

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## **B.S.E.E. in Electrical Engineering** **Description**

The B.S. in electrical engineering program provides broad knowledge in basic and engineering sciences. The curriculum provides thorough knowledge of the field of electrical engineering. Emphasis areas offered are biomedical engineering, computer engineering and general.

**Minimum Total Credit Hours: 128**

### **Goals/Mission Statement**

**Mission Statement** The mission of the electrical engineering department is to provide quality education to the students of the department.

#### **Statement of Goals**

- To provide high quality instruction and intellectual stimulation for the students
- To provide opportunity for undergraduate students to participate in research pursued by faculty
- To instill in our graduates the need for life-long learning
- To enable graduate students to pursue high quality research so that they will emerge as future technological leaders and academics
- To establish strong partnerships and lasting relationships with industry, government, professional societies, alumni and academia. These goals are consistent with the University of Mississippi Vision, Mission, and Core Values Statement and the flagship 2020 goals of UM/2020 Strategic Plan which focuses resources in the areas of instruction, research, and service.

**Undergraduate Program Philosophy** The electrical engineering undergraduate program is founded on basic sciences, mathematics, and engineering science fundamentals. The program emphasizes theoretical foundation as well as the application of scientific knowledge to the solution of engineering problems. This focus is intended to lead students to develop analysis and design skills, and original thought processes that will serve them throughout their careers in a rapidly changing world.

The electrical engineering program is a broad-based program with an emphasis on the fundamentals of electrical engineering. The curriculum consists of background courses in science and mathematics; courses in the humanities, social sciences, and fine arts that foster an appreciation of the interrelationship of basic sciences, technological advances, and society; and major multi- course sequences in engineering. Multi-course sequence areas are

1. Core topics common to many areas of engineering
2. Circuits, electronics, and systems
3. Digital Logic, computer architecture
4. Technical elective courses
5. Engineering design

The BSEE degree program can be pursued with biomedical engineering emphasis or computer engineering emphasis or no emphasis (general). In the first two cases, a specific set of required courses will determine that emphasis area. For general, a broad choice of technical elective courses is available to choose from.

**Program Educational Objectives** Based on our philosophy and goals the Faculty of the Department of Electrical Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Electrical Engineering (BSEE) undergraduate program. The graduates of the program will:

- Demonstrate professional engineering competence by holding positions of increasing responsibility in industry and/or government;
- Continue to improve their technical skills, knowledge and understanding through research and development activities, pursuit of professional certificates and/or advanced degrees;
- Pursue publications of patents and/or entrepreneurship.

**Student Outcomes** Students of the Bachelor of Science in Electrical Engineering program will demonstrate achievement of the following student outcomes:

- a. an ability to apply knowledge of mathematics, science, and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. an ability to function on multidisciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively
- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i. a recognition of the need for, and an ability to engage in life-long learning
- j. a knowledge of contemporary issues
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## **Course Requirements**

Specific requirements for the B.S.E.E. include two CSCI programming courses (Biomedical emphasis or General) or three CSCI programming courses



(Computer emphasis); Engr 309, 310, 321, 360, 361, 410; EI E 100, 235, 236, 331, 341, 351, 352, 353, 367, 385, 386, 391, 431, 461, 462, 485, 486; 11 hours of specified courses for Biomedical, 12 hours of specified courses for Computer, 3 hours of specified course for General; and appropriate hours of technical elective courses (6 hours for Biomedical, 2 for Computer, and 14 for General). Technical elective, if not already included in the requirement, may be chosen from EI E 313, 314, 413, 414, 415, 425, 433, 441, 443, 447, 451, 453, 482, 487, 523, 525, 533, 534, 535, 586; Engr 597; CSci 361, 423, 521, 530, 551, 561.

## Emphasis - Biomedical Engineering Description

The B.S.E.E. with emphasis in biomedical engineering provides broad training in basic and engineering sciences and fundamental knowledge of electrical engineering, with a focus on biomedical engineering.

### General Education Requirements

In addition to the courses specified by the School of Engineering general education requirements, the following are required: Math 263, 264, 353; laboratory science to be fulfilled by Chem 105, 115 and Phys 211, 212, 221, 222. The required 18 hours of humanities/behaviors and social science/fine arts are as specified by the School of Engineering general education requirements but must include Econ 310.

### Course Requirements

Specific requirements for the B.S.E.E. with emphasis in biomedical engineering include Csci 251, 259; Engr 309, 310, 321, 360, 361, 410; EI E 100, 235, 236, 313, 314, 331, 341, 351, 352, 353, 367, 385, 386, 391, 413, 414, 431, 447, 461, 462, 485, 486; and 6 hours of technical elective courses. The senior design in electrical engineering I and II, EI E 461 and 462, should have a biomedical engineering focus. Technical elective courses may be chosen from EI E 415, 425, 433, 441, 443, 447, 451, 453, 482, 487, 523, 525, 533, 534, 535, 586; Engr 597; CSci 361, 423, 521, 530, 551, 561.

### 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.

### General Education

REQUIREMENT	HOURS	DESCRIPTION
<a href="#">Chem 105</a>	3	Complete <a href="#">Chem 105</a> with a passing grade.
<a href="#">Chem 115</a>	1	Complete <a href="#">Chem 115</a> with a passing grade.
<a href="#">Econ 310</a>	3	Complete <a href="#">Econ 310</a> with a passing grade.
First Year Writing I	3	Complete <a href="#">Hon 101</a> , <a href="#">Writ 100</a> or <a href="#">Writ 101</a> with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: <a href="#">Liba 102</a> , <a href="#">Writ 102</a> or <a href="#">Hon 102</a> .
<a href="#">Math 261</a>	3	Complete <a href="#">Math 261</a> with a passing grade.
<a href="#">Math 262</a>	3	Complete <a href="#">Math 262</a> with a passing grade.
<a href="#">Math 263</a>	3	Complete <a href="#">Math 263</a> with a passing grade.
<a href="#">Math 264</a>	3	Complete <a href="#">Math 264</a> with a passing grade.
<a href="#">Math 353</a>	3	Complete <a href="#">Math 353</a> with a passing grade.
<a href="#">Phys 211</a>	3	Complete <a href="#">Phys 211</a> with a passing grade.
<a href="#">Phys 212</a>	3	Complete <a href="#">Phys 212</a> with a passing grade.
<a href="#">Phys 221</a>	1	Complete <a href="#">Phys 221</a> with a passing grade.
<a href="#">Phys 222</a>	1	Complete <a href="#">Phys 222</a> with a passing grade.
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 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 general education work	3	Complete 3 hrs General Education work chosen from the following: additional fine art, additional social science, additional humanities, <a href="#">As 301</a> , <a href="#">As 302</a> , <a href="#">Bus 250</a> , <a href="#">Bus 271</a> , <a href="#">Edld 110</a> , <a href="#">Edld 111</a> , <a href="#">Edld 120</a> , <a href="#">Edld 220</a> , <a href="#">Engr 400</a> , <a href="#">Mgmt 371</a> , <a href="#">Msl 102</a> , <a href="#">Nsc 211</a> , <a href="#">Spch 102</a> , or <a href="#">Spch 105</a> .
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, and Gender Studies.
3 hrs social sciences	3	Complete 3 hours of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology.



## Major Requirements

REQUIREMENT	HOURS	DESCRIPTION
<a href="#">EIE 100</a> or <a href="#">Engr 100</a>	3	Complete <a href="#">EIE 100</a> or <a href="#">Engr 100</a> with a passing grade.
<a href="#">EIE 331</a>	3	Complete <a href="#">EIE 331</a> with a passing grade.
<a href="#">EIE 235</a>	3	Complete <a href="#">EIE 235</a> with a passing grade.
<a href="#">EIE 236</a>	1	Complete <a href="#">EIE 236</a> with a passing grade.
<a href="#">EIE 341</a>	3	Complete <a href="#">EIE 341</a> with a passing grade.
<a href="#">EIE 351</a>	3	Complete <a href="#">EIE 351</a> with a passing grade.
<a href="#">EIE 352</a>	3	Complete <a href="#">EIE 352</a> with a passing grade.
<a href="#">EIE 353</a>	1	Complete <a href="#">EIE 353</a> with a passing grade.
<a href="#">EIE 385</a>	3	Complete <a href="#">EIE 385</a> with a passing grade.
<a href="#">EIE 367</a>	3	Complete <a href="#">EIE 367</a> with a passing grade.
<a href="#">EIE 386</a>	1	Complete <a href="#">EIE 386</a> with a passing grade.
<a href="#">EIE 391</a>	3	Complete <a href="#">EIE 391</a> with a passing grade.
<a href="#">EIE 431</a>	3	Complete <a href="#">EIE 431</a> with a passing grade.
<a href="#">EIE 461</a>	1	Complete <a href="#">EIE 461</a> with a passing grade.
<a href="#">EIE 462</a>	2	Complete <a href="#">EIE 462</a> with a passing grade.
<a href="#">EIE 485</a>	2	Complete <a href="#">EIE 485</a> with a passing grade.
<a href="#">EIE 486</a>	1	Complete <a href="#">EIE 486</a> with a passing grade.
<a href="#">Engr 309</a>	3	Complete <a href="#">Engr 309</a> with a passing grade.
<a href="#">Engr 310</a>	3	Complete <a href="#">Engr 310</a> with a passing grade.
<a href="#">Engr 321</a>	3	Complete <a href="#">Engr 321</a> with a passing grade.
<a href="#">Engr 360</a>	3	Complete <a href="#">Engr 360</a> with a passing grade.
<a href="#">Engr 361</a>	1	Complete <a href="#">Engr 361</a> with a passing grade.
<a href="#">Engr 410</a>	4	Complete <a href="#">Engr 410</a> with a passing grade.
School of Engineering GPA		Must be at least a 2.0
Enroll in a BSEE emphasis		Enroll in an emphasis within the BSEE program.

