B.S.Cp.E. in Computer Engineering

Overview
Degree Requirements

Description

The Bachelor of Science in Computer Engineering program prepares students to have an understanding of computer hardware, software, and electrical engineering fundamentals, thereby acquiring knowledge to develop and/or apply many kinds of computing systems, such as microprocessors, computers, smart phones, and Internet of Things (IoT) devices. Students in the program will have knowledge of computer programming languages, hardware description languages, digital logic design, computer organization, electrical and electronics circuit design, and processing of electrical signals. They will have the ability to apply mathematical and statistical methods for understanding, development, and applications of computing devices.

The graduates of the program will be able to pursue (i) employment in electronic chip design/production companies, hardware/software services companies, and all industries requiring electrical and computer engineers, such as automotive, aerospace, defense, utilities and heavy-machinery; and (ii) advanced study in computer engineering or a related field.

Minimum Total Credit Hours: 126
Goals/Mission Statement

Mission Statement

The mission of the electrical and computer 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 computer 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 computer engineering program is a broad-based program with an emphasis on the fundamentals of computer 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:

- Core topics common to electrical and computer engineering, such as circuits, electronics, signals and systems analysis, and digital systems
- Programming languages, computer operating systems, and algorithms and data structures computer architecture and microprocessors
- Technical elective courses such as embedded systems, VLSI design and testing of computing systems
- Engineering design

The BSCpE degree program can be pursued with the manufacturing emphasis or no emphasis (general). In the manufacturing emphasis, a specific set of courses are required.

Program Educational Objectives

Based on our philosophy and goals the Faculty of the Department of Electrical and Computer Engineering have adopted the following Undergraduate Program Educational Objectives for graduates of the Bachelor of Science in Computer Engineering (BSCpE) 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 Computer Engineering program will demonstrate achievement 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 judgement to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Requirements

The following courses are required: Math 261-264 and Math 353; laboratory sciences to be fulfilled by Chem 105, 115 and Phys 211, 212, 221, 222; Writ 100/101 and Writ 102/Liba 102. Students must also complete at least 18 semester hours of 3 hours in humanities chosen from classics, English, history, modern languages, philosophy, religion, African American studies, gender studies, and Southern studies; 3 hours in fine arts chosen from art history, dance, music, and theatre arts (courses emphasizing the enhancement of skills and performance are not acceptable); 3 hours in social science chosen from anthropology, economics, political science, psychology, and sociology; Econ 310; 3 additional hours of humanities or fine arts; and 3 additional hours of humanities, fine arts, or general education.

Course Requirements

Major Coursework Requirements:

Specific requirements for the B.S.Cp.E. program include Math 301; Csci 256, 356, 423, 433; Engr 310, 360, 361; El E 235, 236, 237, 331, 351, 352, 353, 367, 385, 386, 425, 485, 486; Cp E 431, 461, 462.

Coursework for Standard Emphasis:

Specific requirements for the Standard Emphasis include El E 100; 3 hours selected from Technical Elective I (El E 391, El E 431, or El E 586); 9 hours selected from Technical Elective II (El E 482, 536 CpE 421, or CpE 432); 6 hours of Technical Elective III (El E 447, 453, 533, 534, 535, or other courses from Technical Elective I, II not already completed or a maximum of 3 hours of CSci at 300 level or above) for a total of 19 credit hours.

Coursework for Manufacturing Emphasis:

Specific requirements for the manufacturing emphasis include Manf 150, 152, 251, 252, 253, 255, 351, 353, 355, 455 and 9 hours of technical elective courses to be chosen from El E 482, 536, CpE 421, or CpE 432 for a total of 27 credit hours.

Specializations

- Emphasis - Manufacturing
- Standard Option