ELECTRICAL ENGINEERING, BS

The Electrical Engineering program gives students a broad knowledge of the math, physics, electronics, and power concepts necessary for a career in the discipline. Students will become familiar with electrical and electronic devices, audiovisual equipment, automobile electronics, electric motors, electric power generation and distribution, digital hardware, electromagnetics, remote sensing, signal processing, radar, LiDAR, and software development. Students develop critical-thinking and problem-solving skills throughout their studies. In addition, they develop an ability to apply their knowledge of mathematics, science, and general engineering to address technical issues associated with electro-technology.

Graduates with an Electrical Engineering BS degree commonly begin their careers in a variety of functions including: power generation, management, and distribution engineers; analog electronics designers; digital hardware designers; printed circuit board fabricators; and embedded hardware and software developers. Graduates often work in a wide range of industries including aerospace, defense/military, automotive, medical, software, and consumer electronics. These graduates also pursue post-graduate degrees in Electrical Engineering, Computer Engineering, Computer Science, Business & Commerce, and even professional areas such as Law and Medicine.

Program Educational Objectives and Student Outcomes

The mission of the undergraduate Electrical Engineering program is to provide high-quality and broad-based education in Electrical Engineering that emphasizes critical thinking and communication skills while preparing graduates for professional careers and lifelong learning. The faculty has adopted the educational objectives listed below for the Electrical Engineering undergraduate program. The department has included a process to provide continual improvement of the curricula. Graduates will:

- excel in engineering careers and/or postgraduate education utilizing knowledge of Electrical Engineering disciplines and underlying fundamental principles of science and mathematics, engineering analysis, problem solving, and design
- expand their knowledge of current and emerging issues in Electrical Engineering and continue career-long professional development through engagement in lifelong learning
- grow professionally and advance throughout their engineering careers utilizing skills in effective communication; responsible, multidisciplinary teamwork; and adherence to principles of professional accountability and ethics

To facilitate attainment of these career-long objectives, the department has defined a set of student outcomes and associated assessments to demonstrate that, by graduation, students have:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- An ability to apply engineering design to produce solutions that meet specific needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- An Ability to communicate effectively with a range of audiences
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- 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
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies
- An ability to solve mathematics problems in probability, statistics, differential equations, linear algebra, complex variables, and discrete mathematics as they relate to problems in Electrical Engineering.

The information contained here describes the undergraduate curriculum in Electrical Engineering. Graduate students and students participating in the Accelerated Masters Program (AMP) should consult the graduate catalog for information on all cross-listed and graduate-only courses. More information about various programs within the department is available in the Electrical and Computer Engineering departmental office located in 3043 HM Comer Hall.

The overall goal of the Electrical Engineering program is to prepare students for engineering careers within the discipline. The first year and a half of the Electrical Engineering curriculum includes basic courses in mathematics and physical science, broadening courses in humanities and social science, and foundation courses in engineering. The next three semesters provide the core education in Electrical Engineering, with courses in computers, electronics, circuits, power, and systems. The last year of study includes two semesters of Capstone Design as well as technical electives to allow students to concentrate in selected areas of the discipline. For seniors, the department offers advanced courses in computers, communications, controls, electromagnetics, microelectronics, materials, and power.

To complete the senior-level electives, students must select two Electrical Engineering electives with associated labs (lecture/lab combinations). These lecture/lab combinations must be completed as a pair. Additional materials that describe the curriculum are available in the Electrical and Computer Engineering departmental office and on the Electrical Engineering website.

Click here for details on the College of Engineering policy for repeating courses.

Click here for details on the College of Engineering Residency policy.

Freshman

Fall	Hours	Spring	Hours
CH 101	4	PH 105	4
MATH 125	4	MATH 126	4
ECE 121 or ENGR 111 (Or other ENG intro courses)	1	ENGR 103 or 123	3
EN 101	3	EN 102	3
Humanities (HU), Literature (L), or Fine Arts (FA) Elective[1, 2]	3		
	15		**14**

Sophomore

Fall	Hours	Spring	Hours
PH 106	4	PH 253	3
MATH 227	4	MATH 237	3
MATH 238	3	ECE 225	4
CS 100	0 or 4	ECE 380	4
		Humanities (HU), Literature (L), or Fine Arts (FA) Elective[1, 2]	3
	11-15		**17**

Junior

Fall	Hours	Spring	Hours
MATH 355	3	ECE 326	3
ECE 370	3	ECE 350	3
ECE 332	4	ECE 333	4
ECE 383	4	ECE 330, 455, or PH 301	3
Humanities (HU), Literature (L), or Fine Arts (FA) Elective[1, 2]	3	History (HI) or Social and Behavioral Sciences (SB) Elective[1, 2]	3
	17		**16**

Senior

Fall	Hours	Spring	Hours
ECE 340	4	ECE Elective or Professional Elective[4]	3
ECE Restricted Area Elective[3]	3	ECE Elective	3
ECE 492	2	ECE 494	2
ECE Elective with Laboratory	4	ECE Elective with Laboratory	4
History (HI) or Social and Behavioral Sciences (SB) Elective[1, 2]	3	History (HI) or Social and Behavioral Sciences (SB) Elective[1, 2]	3
	16		**15**

Total Hours: 121-125

Footnotes

1. Students must satisfy the College of Engineering in-depth requirement (minimum of six hours in one discipline).
2. The College of Engineering core curriculum requires a minimum of: nine hours of HU, L, or FA courses; nine hours of HI or SB courses; six hours of FC courses; six hours of W courses (300- and 400-level ECE courses); 12 hours of N courses (eight hours of calculus-based physics); 12 hours of MA courses (MATH 125 or higher); and six hours of C or FL courses.
3. The ECE Restricted Area Elective must be chosen from the list approved by the Department of Electrical and Computer Engineering found on the Electrical Engineering website.
4. The Professional Elective must be chosen from the list approved by the Department of Electrical and Computer Engineering found on the Electrical Engineering website.

Electrical Engineering graduates have career opportunities in a number of industries and fields including, but not limited to, computing, communications, manufacturing, maintenance, utilities, aerospace, automotive, defense/military, medical, robotics and automation, and consumer electronics. The degree also provides an excellent background for graduate study in Electrical Engineering or Computer Engineering as well as Law and Medicine.

Types of Jobs Accepted

Electrical Engineering graduates often gain entry-level positions as utility engineers, facilities engineers, programmers, or design engineers with various engineering firms, consulting firms, and companies across a wide range of industries.

Jobs of Experienced Alumni

Alumni of the Department of Electrical and Computer Engineering currently hold positions such as distribution manager, Alabama Power; vice president, ADTRAN; and senior design engineer, Radiance Technologies; senior engineer, TSC.

Learn more about opportunities in this field at the Career Center