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Curriculum in Electrical Engineering

Electrical engineers develop and apply the theories of electricity, electronics and electromagnetics to analyze and design systems which generate or use electricity. Examples of such systems are those for power generation and transmission, computation, communication, automatic control and instrumentation. The devices that practicing engineers work with and design include integrated circuits (VLSI), waveguides, antennas, computers and other digital systems, rotating machines and motor drives, lasers and optical fibers.

The curriculum is designed to prepare the undergraduate for work in the highly diverse electrical engineering profession. A solid foundation in physics, chemistry and mathematics is used to support courses in the fundamentals of electrical engineering. The use of computers is integrated throughout the curriculum, and basic studies in circuits, electronics, electromagnetic fields and digital logic lead to a flexible program of electives in the junior and senior year. Electives may be chosen from the broad categories of controls and communications, microelectronic circuit design, computer engineering, power systems and electromagnetics/electro-optics. Laboratory work is structured to first familiarize the student with the basic concepts and then to apply these concepts to engineering problems.

Students who expect to enroll in electrical engineering after attending another college or university should note that there is a five-semester sequence of electrical engineering courses in the curriculum. If the prerequisites are satisfied, transfer students may complete this sequence in two years and one summer session.

Educational Program Objectives

Philosophically, the basis for the educational program objectives are the commonly held department goals for a B.S. degree in electrical engineering. Program objectives are descriptions of what the Department of Electrical Engineering is trying to accomplish in its undergraduate program. Program educational objectives are measured in terms of accomplishments for the department, e.g., an entire graduating class. There appears to be agreement that:

- Graduates should be productive, contributing members of society.
- Graduates should be equipped for a long and varied professional career.
- Graduates should have confidence that their undergraduate education has provided solid preparation.

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However, these goals are ambiguous enough that it is difficult for the department to determine if its undergraduate educational program is meeting these goals. Therefore, the department seeks to develop a set of educational program objectives and a set of measurement processes that allow the department to determine if its objectives are being met. Specifically, the following are proposed:

Educational Program Objective 1 --A significant percentage of electrical engineering graduates will have made significant technical and/or professional achievement within five years of graduation.

Educational Program Objective 2 --The demand for graduates from the electrical engineering program will be higher than the national average.

Educational Program Objective 3 --Graduates will be highly satisfied with the preparation that they received as an undergraduate.

Educational Program Objective 4 --Graduates will demonstrate attributes that indicate commitment to and ability for lifelong learning. These attributes include: intellectual curiosity, internal motivation, ownership of learning, initiative, self-reflection, self-assessment, adaptability and flexibility.

Educational Objective 5 --A significant percentage of electrical engineering graduates will attend graduate school.

(See Freshman Year)

Sophomore Year

First Semester	(Th-Pr)	Cr		Second Semester	(Th-Pr)	Cr
ENGR 211 Conserv. Prin. of Engr. Mech.	(2-2)	3		ELEN 214 Electrical Circuit Theory	(3-3)	4
ENGR 212 Conserv. Prin. in Thermal Sci.	(2-2)	3		ELEN 248 Intro. to Dig. Sys. Design	(3-3)	4
MATH 251 Engineering Mathematics III	(3-0)	3		MATH 308 Differential Equations	(3-0)	3
University Core Curriculum electives *1*		6		PHYS 222 Mod. Physics for Engineers	(3-0)	3
		15				14

Junior Year

ELEN 314 Linear Circuit Analysis	**(3-0)**	**3**		**ENGL 210 Scientific and Tech. Writing**		
ELEN 322 Elec. and Magnetic Fields	(3-0)	3		or		
ELEN 325 Electronics	(3-3)	4		ENGL 301 Technical Writing	(3-0)	3
ELEN 370 Elec. Props. of Matls.	(3-0)	3		STAT 211 Prin. of Statistics I		
MATH 311 Topics in Applied Mathematics I	(3-0)	3		or		

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		16		STAT 414 Mathematical Statistics	(3-0)	3
				Electrical engineering electives *2*		6
				University Core Curriculum elective *1*		3
						15

Senior Year

INEN 302 Econ. Analysis of Engr. Projects	**(2-0)**	**2**		**ELEN 405 Electrical Design Lab.**	**(1-6)**	**3**
Electrical engineering electives *2*		12		ENGR 482 Ethics and Engineering	(2-2)	3
University Core Curriculum elective *1*		3		Electrical engineering electives *2*		6
		17		Electives		6
						18

NOTES:
1. To be selected from the University Core Curriculum. Of the 18 hours shown as University Core Curriculum electives, 3 must be from visual and performing arts, 3 from social and behavioral sciences, 6 from U.S. history, 6 from POLS 206 and 207, and 6 from international and cultural diversity. The international and cultural diversity requirement may be met by courses satisfying the visual and performing arts, social and behavioral sciences, and the political science and history requirements if they are also on the approved list of international and cultural diversity courses.

2. A list of basic electives in electrical engineering, available from the department office, has been divided into five technical areas. Students must meet the following restrictions in their selection of these electives:

a. Students are required to take at least three courses from one technical area.

b. Students are required to take four other technical electives from at least two technical areas not selected in (a).

c. Remaining electrical engineering electives may be selected from any 300- or 400-level electrical engineering course.

The Systems Safety Engineering Specialty is available for students pursuing this degree. for detailed information.

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