

ELECTRICAL ENGINEERING, BACHELOR OF SCIENCE (BS)

This degree combines studies in selected areas of engineering, physics, mathematics, and science to prepare students to solve real-world problems in electrical engineering. The Bachelor of Science in Electrical Engineering Degree is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>).

The first two years of the curriculum allow students to establish a solid foundation in mathematics and sciences. The third year curriculum introduces students to a broad spectrum of electrical engineering coursework, followed by specialization courses and a capstone design experience in the fourth year. The senior year capstone course allows students to consolidate their education experience with the solution of real-world, practical engineering problems often provided by industry.

The primary objective of the electrical engineering program is to prepare students to enter and progress in electrical engineering positions in business, industry and government. Graduates are generally expected to work in the research and development of ideas, products and processes by applying engineering principles to the solution of practical problems in the electrical engineering field.

Note: incoming freshmen are expected to start both the Calculus and Physics series in their first year in order to finish the degree in four years.

Required Courses Outside Department

CHEM 151	GENERAL CHEMISTRY	5
CSCD 255	C PROGRAMMING FOR ENGINEERS	5
MATH 161	CALCULUS I	5
MATH 162	CALCULUS II	5
MATH 163	CALCULUS III	5
MATH 231	LINEAR ALGEBRA	5
MATH 241	CALCULUS IV	5
MATH 347	INTRODUCTORY DIFFERENTIAL EQUATIONS	4
PHYS 151	GENERAL PHYSICS I	4
PHYS 152	GENERAL PHYSICS II	4
PHYS 153	GENERAL PHYSICS III	4
PHYS 161	MECHANICS LABORATORY	1
PHYS 162	HEAT AND OPTICS LABORATORY	1
PHYS 163	INSTRUMENTATION LAB I	1
TCOM 205 or MENG 381	INTRODUCTION TO TECHNICAL COMMUNICATION LABORATORY ANALYSIS AND REPORTS	5

Required Departmental Courses

EENG 160	DIGITAL CIRCUITS	4
EENG 209	CIRCUIT THEORY I	5
EENG 210	CIRCUIT THEORY II	5
EENG 250	DIGITAL HARDWARE	2
EENG 260	MICROCONTROLLER SYSTEMS	4
EENG 320	SIGNALS AND SYSTEMS I	5
EENG 321	SIGNALS AND SYSTEMS II	5
EENG 330	MICROELECTRONICS I	5
EENG 331	MICROELECTRONICS II	5
EENG 350	ENERGY SYSTEMS	5
EENG 360	HARDWARE DESCRIPTION LANGUAGES	5

EENG 383	APPLIED STOCHASTIC PROCESSES	4
EENG 388	STOCHASTIC PROCESSES LAB	1
EENG 401 or PHYS 401	ENGINEERING APPLIED ELECTROMAGNETICS ELECTROMAGNETISM I	4-5
EENG 490A & EENG 490B	SR CAPSTONE: DESIGN LAB I and SR CAPSTONE: DESIGN LAB II	5
TECH 393	TECHNOLOGY WORLD CIVILIZATION	4
Electives Electrical Engineering—students must take at least three courses from one area of concentration.		25

Power Systems

EENG 450	POWER SYSTEMS ANALYSIS
EENG 452	PROTECTIVE RELAYS
EENG 470	CONTROL SYSTEMS

Communications and Signal Processing

EENG 420	DIGITAL SIGNAL PROCESSING
EENG 440	DIGITAL COMMUNICATION SYSTEMS
EENG 470	CONTROL SYSTEMS

VLSI and Circuit Design

EENG 430	CMOS DIGITAL INTEGRATED CIRCUITS DESIGN
EENG 435	ANALOG INTEGRATED CIRCUITS DESIGN
EENG 460	COMPUTING SYSTEMS: ORGANIZATION AND DESIGN
or EENG 461	EMBEDDED SYSTEM DESIGNS

Other Courses

EENG 415	INTRODUCTION TO COMPUTER COMMUNICATION NETWORKS
EENG 425	PRINCIPLES OF DIGITAL IMAGE PROCESSING
EENG 442	MOBILE COMMUNICATIONS
EENG 471	DIGITAL CONTROL SYSTEMS
EENG 495	INTERNSHIP

Total Credits 152-153

For information on General Education, see Undergraduate Degree (<http://catalog.ewu.edu/archives/2016-2017/undergraduate-degree>).

Student Learning Outcomes—students will

- apply knowledge of mathematics, science and engineering;
- design and conduct experiments, as well as analyze and interpret data;
- 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;
- function on multidisciplinary teams;
- identify, formulate, and solve engineering problems;
- understand professional and ethical responsibility;
- communicate effectively;
- have the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- recognize the need for and demonstrate an ability to engage in life-long learning;
- have a knowledge of contemporary issues;

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- use the techniques, skills and modern engineering tools necessary for engineering practice.