ELECTRICAL ENGINEERING (ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, & DATA SCIENCE) - BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **communications and signal processing**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-124 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

BSEE students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. A student may attempt any of these courses no more than three times to earn a passing grade of C- or better. Students who earn a grade less than a C- will be contacted by the department head or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to pass any of these courses after three attempts, then the student will not be able to continue as an electrical engineering major and will be counseled on other degree options. Students may request an exception to this policy through written appeal to the Associate Dean for Academics in the College of Engineering.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
English Composition - Level 2 [1]		3
Oral Communications [1]		3
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World		
Viewing a Wider World Electives [3]		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
STEM		
Choose two STEM Electives [4]		6
Electrical and Computer Engineering		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I [5]	3
ENGR 402	Engineering Capstone II	3
E E Concentration Required Courses		
E E 395	Introduction to Digital Signal Processing [6]	3
E E 465	Machine Learning I [6]	3
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [7]		6-7
E E 406	Quantum Computing	
E E 444	Advanced Image Processing	
E E 446	Digital Image Processing	
E E 447	Neural Signal Processing	
C S 343	Algorithm Design & Implementation	
C S 372	Data Structures and Algorithms	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 475	Artificial Intelligence I	
C S 486	Bioinformatics	
C S 488	Introduction to Data Mining	
C S 491	Parallel Programming	
MATH 3120	Introduction to Analysis	
MATH 3130	Introduction to Geometry	
MATH 3140	Introduction to Numerical Methods	
MATH 4310	Introduction to Topology	

MATH 4230	Applied Linear Algebra	
MATH 4350	Advanced Linear Algebra	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Programming Elective		
Select one course from the following:		3
C S 153	Python Programming I [8]	
or C S 453	Python Programming I	
C S 154	Python Programming II [8]	
or C S 454	Python Programming II	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-124**

[1] See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses.

[2] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

[3] See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.

[4] STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

[5] The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.

[6] Students must take both E E 395 Introduction to Digital Signal Processing and E E 465 Machine Learning I, both of which are offered in the Fall semester.

[7] Some of these elective courses may have additional prerequisites.

[8] Only one of the 100-level xor the 400-level course may be taken to satisfy degree requirements. Students may not take the 100-level of a course to satisfy the programming elective requirement and the 400-level of the same course to satisfy other degree requirements.