

ELECTRICAL ENGINEERING (CONTROL & POWER) - 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 **control and power systems**.

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.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2¹</i>		
		3
<i>Oral Communication¹</i>		
		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
		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	
<i>Area IV: Social/Behavioral Sciences (3 credits)¹</i>		
		3
<i>Area V: Humanities¹</i>		
		3
<i>Area VI: Creative and Fine Arts¹</i>		
		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World³		
	Viewing a Wider World Electives	6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		
MATH 392	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
<i>STEM</i>		
	Choose two STEM Electives ⁴	6
<i>Electrical and Computer Engineering</i>		
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	3
ENGR 402	Engineering Capstone II	3
<i>E E Concentration Required Courses</i>		
E E 431	Power Systems II	3
E E 475	Control Systems Synthesis	3
	<i>E E Concentration Electives: Choose two courses from the following (one must be an E E course):</i>	6
E E 432	Power Electronics	
E E 440	Photovoltaic Devices and Systems	
E E 476	Computer Control Systems	
E E 493	Power Systems III	
C S 343	Algorithm Design & Implementation	
CHME 361	Engineering Materials	
M E 481	Alternative and Renewable Energy	
M E 487	Mechatronics	
MATH 480	Applied Linear Algebra	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Programming Elective</i>		
	Select one course from the following:	3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		0
Total Credits		123-124

¹ See the General Education (<http://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 (<http://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>).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16

Spring

MATH 1511G	Calculus and Analytic Geometry I	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15

Second Year

Fall		Credits
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16

Spring

MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		16-17

Third Year

Fall		Credits
E E 300	Cornerstone Design	2

E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3

Credits **15**

Spring

E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3

Credits **15**

Fourth Year

Fall

ENGR 401	Engineering Capstone I	3
E E 431	Power Systems II ³	3
E E 475	Control Systems Synthesis ³	3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3

Credits **15**

Spring

ENGR 402	Engineering Capstone II	3
Control & Power Elective ^{5,6}		3
Control & Power Elective ^{5,6}		3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3

Credits **15**

Total Credits **123-124**

¹ 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.

² See the General Education and Viewing a Wider World (<http://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.

³ Students must take both E E 431 Power Systems II and E E 475 Control Systems Synthesis, both of which are offered in the Fall semester.

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 Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

⁶ One Control & Power Elective Courses must be from the E E Prefix.

Control & Power Elective Courses:

- E E 432 Power Electronics, E E 440 Photovoltaic Devices and Systems, E E 476 Computer Control Systems, E E 493 Power Systems III
- C S 343 Algorithm Design & Implementation, C S 483
- CHME 361 Engineering Materials

- M E 481 Alternative and Renewable Energy, M E 487 Mechatronics
- MATH 480 Applied Linear Algebra