ELECTRICAL ENGINEERING (POWER) - BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Overview

The Electrical Engineering BS program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **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.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

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 129 credits with 48 credits in courses numbered 300/3000 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. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
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 [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 333	AC Circuit Analysis and Introduction to Power Systems [5]	
E E 431	Power System Analysis [5]	

or E E 542	Power System Analysis	
or E E 475	Control Systems Synthesis	
or E E 551	Control Systems Synthesis	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6*
E E 405	Electricity Markets	
or E E 502	Electricity Markets	
E E 431	Power System Analysis [7]	
or E E 542	Power System Analysis	
E E 432	Power Electronics	
or E E 537	Power Electronics	
E E 433	Power System Operation	
or E E 533	Power System Operation	
E E 434	Numerical Computational Methods for Smart Grid	
or E E 503	Numerical Computational Methods for Smart Grid	
E E 435	Smart Grid Technologies	
or E E 504	Smart Grid Technologies	
E E 440	Photovoltaic Devices and Systems	
or E E 540	Photovoltaic Devices and Systems	
E E 475	Control Systems Synthesis [7]	
or E E 551	Control Systems Synthesis	
E E 493	Power System Faults and Stability	
or E E 543	Power System Faults and Stability	
CSCI 3790	Algorithm Design & Implementation	
MATH 4230	Applied Linear Algebra	
Non-Departmental Requirements (in addition to Gen.Ed)		
Programming Elective		
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [8]	
or CSCI 4510	C++ Programming	
CSCI 1210	Java Programming [8]	
or CSCI 4505	Java Programming	
CSCI 1220	Computer Programming Fundamentals: Python [8]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II	
or CSCI 4525	Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	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 (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 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, 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).

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

5 Students must take E E 333 AC Circuit Analysis and Introduction to Power Systems which is currently offered in the Fall semester and (E E 431 Power System Analysis or E E 542 Power System Analysis which is currently offered in the Spring semester or E E 475 Control Systems Synthesis or E E 551 Control Systems Synthesis which is currently offered in the Spring semester). Please also note that E E 333 AC Circuit Analysis and Introduction to Power Systems is a prerequisite to E E 431 Power System Analysis/E E 542 Power System Analysis and E E 407 Introduction to Control Systems is a prerequisite to E E 475 Control Systems Synthesis/E E 551 Control Systems Synthesis .

6 Some of these elective courses may have additional prerequisites.

7 This course can satisfy either an E E Concentration Required Course or an E E Concentration Elective, but not both.

8 Only one of the 1000-level or the 4000-level course may be taken to satisfy degree requirements. Students may not take the 1000-level of a course to satisfy the programming elective requirement and the 4000-level of the same course to satisfy other degree requirements.

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 or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or 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 or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	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 3160	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
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Java Programming or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
General Education Course [2]		3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Course [2]		3
General Education Course [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 Course [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 333	AC Circuit Analysis and Introduction to Power Systems	3
Power Elective [5,6]		3
STEM Elective [4,5]		3
General Education Course [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Choose one of the following:		3
E E 431 or E E 542 or E E 475 or E E 551	Power System Analysis or Power System Analysis or Control Systems Synthesis or Control Systems Synthesis	
Power Elective [5,6]		3
STEM Elective [4,5]		3
General Education Course [2]		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 (https://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 333 AC Circuit Analysis and Introduction to Power Systems which is currently offered in the Fall semester and (E E 431 Power System Analysis or E E 542 Power System Analysis or E E 475 Control Systems Synthesis or E E 551 Control Systems Synthesis) which are currently offered in the Spring semester.
4. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, 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 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 Course must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.