# ELECTRICAL ENGINEERING (SPACE SYSTEMS ENGINEERING) - BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

## Overview

The Electrical Engineering Bachelor of Science program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org (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 Bachelor of Science in Electrical Engineering program gives students the opportunity to explore more deeply the area of **space 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 (123-126 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 300/3000 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.

Bachelor of Science in Electrical Engineering 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 | |
| *English Composition - Level 2* [1] | | *3* |
| *Oral Communication* [1] | | *3* |
| *Area II: Mathematics* | | *4* |
| MATH 1511G | Calculus and Analytic Geometry I [2] | |
| *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 | |
| **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 460 | Space System Mission Design and Analysis [5] | |
| ASTR 402 | Astronomical Observations and Techniques [5] | |
| or ASTR 401 | Topics in Modern Astrophysics | |
| or A E 362 | Orbital Mechanics | |

| *E E Concentration Electives: Choose two courses from the following (one must be an E E course):* [6] | | 6-8 |
|---|---|---|
| E E 495 | Introduction to Digital Signal Processing | |
| E E 454 | Antennas and Radiation | |
| or E E 541 | Antennas and Radiation | |
| E E 473 | Introduction to Optics | |
| E E 478 | Fundamentals of Photonics | |
| or E E 528 | Fundamentals of Photonics | |
| E E 496 | Introduction to Communication Systems | |
| A E 362 | Orbital Mechanics [7] | |
| ASTR 401 | Topics in Modern Astrophysics [7] | |
| ASTR 402 | Astronomical Observations and Techniques [7] | |
| **Non-Departmental Requirements (in addition to Gen.Ed)** | | |
| Viewing a Wider World Electives [8] | | 6 |
| *Programming Elective* | | |
| Select one course from the following: | | 3-4 |
| CSCI 1240 | C++ Programming I [9] | |
| or CSCI 4510 | C++ Programming | |
| CSCI 1210 | Computer Programming Fundamentals [9] | |
| or CSCI 4510 | C++ Programming | |
| CSCI 1220 | Computer Programming Fundamentals: Python [9] | |
| or CSCI 4520 | Python Programming I | |
| CSCI 1225 | Python Programming II [9] | |
| or CSCI 4520 | Python Programming I | |
| 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** | | **123-126** |

[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 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, 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 460 Space System Mission Design and Analysis which is currently offered in the Spring semester and (ASTR 401 Topics in Modern Astrophysics or ASTR 402 Astronomical Observations and Techniques which are currently offered in the Spring semester or A E 362 Orbital Mechanics which is currently offered in the Fall semester).

[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] 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.

[9] Only one of the 100/1000-level or the 400/4000-level course may be taken to satisfy degree requirements. Students may not take the 100/1000-level of a course to satisfy the programming elective requirement and the 400/4000-level of the same course to satisfy other degree requirements.