

COMPUTER ENGINEERING - BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

Overview

This particular program gives students the opportunity to explore more deeply the area of **computer Engineering**.

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 (128-131 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 128 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.

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		
<i>Area I: Communications</i>		

<i>English Composition - Level 1</i>		4
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
<i>English Composition - Level 2¹</i>		3
<i>Oral Communication¹</i>		3
<i>Area II: Mathematics</i>		4
MATH 1511G	Calculus and Analytic Geometry I ²	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
<i>Area III: Laboratory Sciences</i>		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	
<i>Area IV: Social/Behavioral Sciences¹</i>		3
<i>Area V: Humanities¹</i>		3
<i>Area VI: Creative and Fine Arts¹</i>		3
<i>General Education Elective</i>		4
MATH 1521G	Calculus and Analytic Geometry II (Required Mathematics and Natural Science)	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		16
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	
CSCI 2310	Discrete Mathematics for Computer Science	
<i>STEM</i>		3
Choose one STEM Elective ³		
<i>Required Courses (Electrical and Computer Engineering & Computer Science)</i>		53
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 362	Introduction to Computer Organization	
E E 462	Computer Systems Architecture	
E E 480	Introduction to Analog and Digital VLSI	
ENGR 401	Engineering Capstone I ⁴	
ENGR 402	Engineering Capstone II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
CSCI 2220	Introduction to Data Structures and Algorithms	
<i>Computer Engineering Electives: Choose five courses from the following (two must be ECE courses):⁵</i>		15-18
E E 409	Hardware & Software Codesign	
E E 412	ASIC Design	
E E 458	Hardware Security and Trust	
E E 465	Machine Learning I	
E E 467	ARM SOC Design	
E E 406	Quantum Computing	

E E 490	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
CHME 467	Nanoscience and Nanotechnology	
CSCI 3790	Algorithm Design & Implementation	
CSCI 3730	Compilers and Automata Theory	
CSCI 3710	Software Development	
CSCI 3720	Data Structures and Algorithms	
CSCI 4105	Programming Language Structure I	
CSCI 4120	Operating Systems I	
CSCI 4205	Computer Security	
CSCI 4140	Database Management Systems I	
CSCI 4245	Computer Networks I	
CSCI 4420	Applied Machine Learning I	
CSCI 4215	Parallel Programming	
CSCI 4590	Algorithm Design and Implementation	
CSCI 4220	Cloud and Edge Computing	
MATH 3140	Introduction to Numerical Methods	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives ⁶		6
Second Language Requirement (none required)		
Electives to bring total credits to 128		
Total Credits		128-131

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 first.

³ STEM Elective: Course at the 300/3000 level or above from E E or CSCI that is not used to satisfy any other program specific requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E or CSCI 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 computer engineering students is E E 300 Cornerstone Design.

⁵ Some of these elective courses may have additional prerequisites.

⁶ 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.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G. 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		Credits
Fall		
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
or ENGL 1110H	or Composition I Honors	
or ENGL 1110M	or Composition I	
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 ¹	4
or MATH 1511H	or Calculus and Analytic Geometry I Honors	
CSCI 1720	Computer Science I	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		16
Second Year		
Fall		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	or Calculus and Analytic Geometry II Honors	
PHYS 1310G	Calculus -Based Physics I	4
& PHYS 1310L	and Calculus -Based Physics I Lab	
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16
Spring		
CSCI 2310	Discrete Mathematics for Computer Science	4
PHYS 1320G	Calculus -Based Physics II	4
& PHYS 1320L	and Calculus -Based Physics II Lab	
CSCI 2210	Object-Oriented Programming	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		18
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
CSCI 2220	Introduction to Data Structures and Algorithms	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		16
Spring		
E E 320	Signals and Systems I	3
E E 362	Introduction to Computer Organization	4
General Education Course ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
STEM Elective ^{3,4}		3
Credits		16
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 462	Computer Systems Architecture	3
E E 480	Introduction to Analog and Digital VLSI	3
Comp Engineering Elective ^{3,5}		3
Comp Engineering Elective ^{3,5}		3-4
Credits		15-16
Spring		
ENGR 402	Engineering Capstone II	3
Comp Engineering Elective ^{3,5}		3
Comp Engineering Elective ^{3,5}		3-4
Comp Engineering Elective ^{3,5}		3-4

General Education Requirement (Area I, IV, V, VI or VWW) ²	3
Credits	15-17
Total Credits	128-131

- 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 Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the Comp Engineering Electives, STEM electives, and/or Gen Ed electives in their junior and senior year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
- ⁴ STEM Elective: Course at the 300/3000 level or above from E E or CSCI that is not used to satisfy any other program specific requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E or CSCI course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).
- ⁵ At least two computer engineering electives must be from the E E prefix. See Computer Engineering Electives in the Degree Requirements section above.