MAJOR IN COMPUTER ENGINEERING

Requirements Effective Fall 2025

In order to maintain professional standards required of practicing engineers, the Department of Electrical and Computer Engineering requires a cumulative grade point average of at least 2.000 in Electrical Engineering courses as a graduation requirement. It is the responsibility of any student who fails to maintain a 2.000 average to work with their advisor to correct grade point deficiencies. ECE courses required for the major at the 100, 200, and 300 level must be passed with a minimum grade of C (2.000); grades below a C will require the student to retake the course. ECE courses designated as an elective are exempt from the C or higher minimum grade requirement.

Freshman

		AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CO 150	College Composition (GT-CO2)	1A	3
ENGR 111	Fundamentals of Engineering		3
ENGR 114	Engineering for Grand Challenges		3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	4
Select one group from the following:[1]			7
Group A			
CS 150B	Culture and Coding: Python (GT-AH3)	3B	
CS 164	CS1--Computational Thinking with Java		
Group B			
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	
CS 152	Python for STEM		
CS 162	CS1--Introduction to Java Programming		
Group C			
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	
CS 163	CS1---No Prior Programming Experience		
	Total Credits		**29**

Sophomore

CS 165	CS2--Data Structures		4
CT 301	C++ Fundamentals		2
ECE 205	Analog Circuits I		2
ECE 206	Analog Circuits II		3
ECE 232	Introduction to Project Practices		1
ECE 252	Introduction to Digital Circuits		3
ECE 253	Microcontrollers and C for Internet-of-Things		3
ECE 303/STAT 303	Introduction to Communications Principles		3
MATH 261	Calculus for Physical Scientists III		4
MATH 340	Intro to Ordinary Differential Equations		4
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	5
	Total Credits		**34**

Junior

CS 214	Software Development		3
CS 220	Discrete Structures and the Applications		4
ECE 311	Linear System Analysis I		3

ECON 202	Principles of Microeconomics (GT-SS1)	3C	3
JTC 300 or CO 301B	Strategic Writing and Communication (GT-CO3) Writing in the Disciplines: Sciences (GT-CO3)	2	3
Select a minimum of three credits from the following:			3
DSCI 369	Linear Algebra for Data Science		
MATH 369	Linear Algebra I		
Computer Engineering Electives - Group 1 (see list below)			11
	Total Credits		**30**

Senior

ECE 401	Senior Design Project I	4A,4B	3
ECE 402	Senior Design Project II	4C	3
Computer Engineering Electives - Group 2 and Group 3 and/or Technical Electives (see lists below)[2]			18
1C (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)		1C	3
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	3
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
	Total Credits		**33**
	Program Total Credits:		**126**

Computer Engineering Electives - Group 1

Code	Title	Credits
Choose a minimum of 11 credits from the courses below:		
ECE 450	Digital System Design Laboratory	1
ECE 451	Digital System Design	3
ECE 452	Computer Organization and Architecture	3
ECE 456	Computer Networks	4
ECE 528/CS 528	Embedded Systems and Machine Learning	4

Computer Engineering Electives - Group 2 and Group 3

Code	Title	Credits
Group 2 - Choose 0-11 credits from the list below: [2]		0-11
DSCI 320/ MATH 320	Optimization Methods in Data Science	
ECE 312	Linear System Analysis II	
ECE 331	Electronics Principles I	
ECE 332	Electronics Principles II	
Group 3 - Choose 0-3 credits from the list below: [2]		0-3
ECE 395A	Independent Study [3]	
ECE 395B	Independent Study: Open Option Project [3]	
ECE 395C	Independent Study : Vertically Integrated Project [3]	
IDEA 310L	Design Thinking Toolbox : Creating Things That Think	
IDEA 310O	Design Thinking Toolbox: Digital Interaction and Game Design	

Technical Electives 4-18 credits

Code	Title	Credits
CS 310H/IDEA 310H	Design Thinking Toolbox: Mixed Reality Design	3
CS 314	Software Engineering	3
CS 320	Algorithms--Theory and Practice	3
CS 345	Machine Learning Foundations and Practice	3
CS 356	Systems Security	3
CS 370	Operating Systems	3
CS 4XX Any CS course numbered 400-479, excluding CS 457 and CS 470		
CS 5XX Any CS course numbered 500-579		
CT 307	High Performance Programming in Rust	2
DSCI 475	Topological Data Analysis	2
ECE 340	Electromagnetics for Computer Engineering	3
ECE 4XX Any ECE course at the 400-level		
ECE 495A	Independent Study [3]	1-6
ECE 495B	Independent Study: Open Option Project [3]	1
ECE 495C	Independent Study: Vertically Integrated Projects [3]	1
ECE 5XX Any ECE course at the 500-level, excluding ECE 532/ SYSE 532		
ENGR 430	Engineering With Drones	3
ENGR 478	Applied Engineering Data Analytics	3
MATH 360	Mathematics of Information Security	3
MATH 450	Introduction to Numerical Analysis I	3
MATH 451	Introduction to Numerical Analysis II	3
MATH 460	Information and Coding Theory	3
MATH 463	Post-Quantum Cryptography	3

MECH 564	Fundamentals of Robot Mechanics and Controls	3
STAT 421	Introduction to Stochastic Processes	3

1 Recommended sequence for most incoming students is Group A: CS 150B to CS 164.

2 Students will use 0-11 credits of Group 2 and 0-3 of Group 3 Computer Engineering Electives and 4-18 credits of Technical Electives to reach the required total of 126 program credits.

3 A total of 6 credits of Independent Study may apply toward total degree requirements. This includes credit awarded for ECE 395A, ECE 395B, ECE 395C, ECE 495A, ECE 495B, and ECE 495C combined.