MAJOR IN ELECTRICAL ENGINEERING, LASERS AND OPTICAL ENGINEERING CONCENTRATION

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.

Requirements
Effective Fall 2023

In order to maintain professional standards required of practicing engineers, the Department of Electrical and Computer Engineering

Freshman

		AUCC	Credits
CO 150	College Composition (GT-CO2)	1A	3
ECE 102	Digital Circuit Logic		4
ECE 103	DC Circuit Analysis		3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	4
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	5
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:			
CS 152	Python for STEM		
CS 162	CS1--Introduction to Java Programming		
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	
Group C:			
CS 163	CS1---No Prior Programming Experience		
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	
	Total Credits		**30**

Sophomore

CHEM 111	General Chemistry I (GT-SC2)	3A	4
ECE 202	Circuit Theory Applications		4
ECE 232	Introduction to Project Practices		1
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 142	Physics for Scientists and Engineers II (GT-SC1)	3A	5
PH 314	Introduction to Modern Physics		4
Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion)		1C	3
	Total Credits		**32**

Junior

ECE 311	Linear System Analysis I		3
ECE 331	Electronics Principles I		4

ECE 332	Electronics Principles II	4A	4
ECE 341	Electromagnetic Fields and Devices I		3
ECE 342	Electromagnetic Fields and Devices II		3
ECON 202	Principles of Microeconomics (GT-SS1)	3C	3
PH 353	Optics and Waves		4
Select one course from the following:			3
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)	2	
JTC 300	Strategic Writing and Communication (GT-CO3)	2	
Science/Engineering Elective (see list below)			2
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	3
	Total Credits		**32**

Senior

ECE 401[2]	Senior Design Project I	4A,4B	3
ECE 402	Senior Design Project II	4C	3
ECE 404	Experiments in Optical Electronics		2
ECE 441	Optical Electronics		3
ECE 457	Fourier Optics		3
PH 451	Introductory Quantum Mechanics I		3
Technical Electives (see list below)			12
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
	Total Credits		**32**
	Program Total Credits:		**126**

Science/Math/Engineering Electives

Code	Title	Credits
BC 351	Principles of Biochemistry	4
BIOM 100	Overview of Biomedical Engineering	1
BIOM 200	Fundamentals of Biomedical Engineering	2
BMS 300	Principles of Human Physiology	4
BMS 301	Human Gross Anatomy	5
BMS 325	Cellular Neurobiology	3
BMS 345	Functional Neuroanatomy	4
BZ 310	Cell Biology	4
CBE 101	Introduction to Chemical and Biological Engr	3
CBE 101A	Introduction to Chemical and Biological Engr: Lecture	2
CBE 101B	Introduction to Chemical and Biological Engr: Laboratory	1
CHEM 112	General Chemistry Lab I (GT-SC1)	1
CHEM 245	Fundamentals of Organic Chemistry	4
CHEM 246	Fundamentals of Organic Chemistry Laboratory	1
CIVE 102	Introduction to Civil and Environmental Engr	3
CIVE 260	Engineering Mechanics-Statics	3
CIVE 371	Study Abroad--Peru: Grand Challenges in Engineering in Peru	3
CS 165	CS2--Data Structures	4
CS 220	Discrete Structures and their Applications	4
CS 253	Software Development with C++	4
CS 310H/IDEA 310H	Design Thinking Toolbox: Mixed Reality Design	3
DSCI 320	Optimization Methods in Data Science	3
ECE 101	Foundations in ECE	1
May select any course from the following: [3]		Var.
ECE 395A	Independent Study	
ECE 395B	Independent Study: Open Option Project	
ECE 395C	Independent Study : Vertically Integrated Project	
ENGR 300	3D Printing Lab for Engineers	1
ENGR 478	Applied Engineering Data Analytics	3
HES 307	Biomechanical Principles of Human Movement	3
LIFE 103	Biology of Organisms-Animals and Plants (GT-SC1)	4
MATH 151	Mathematical Algorithms in Matlab I	1
MATH 229	Matrices and Linear Equations	2
MATH 235	Introduction to Mathematical Reasoning	2
MATH 317	Advanced Calculus of One Variable	3
MATH 332	Partial Differential Equations	3
MATH 360	Mathematics of Information Security	3
MATH 366	Introduction to Abstract Algebra	3
MATH 369	Linear Algebra I	3
or DSCI 369	Linear Algebra for Data Science	
MECH 103	Introduction to Mechanical Engineering	3

MECH 104A	Study Abroad--Germany: Introduction to Mechanical Engineering	3
MECH 200	Introduction to Manufacturing Processes	3
MECH 201	Engineering Design I	2
MECH 237 or MECH 337	Introduction to Thermal Sciences Thermodynamics	3-4
MIP 300	General Microbiology	3
PH 341	Mechanics	4
PSY 253	Human Factors and Engineering Psychology	3
STAT 158	Introduction to R Programming	1

Technical Electives

Code	Title	Credits
ECE 312	Linear System Analysis II	3
ECE 415	Semiconductor Physics and Junctions	2
ECE 430/MATH 430	Fourier and Wavelet Analysis with Apps	3
May select any course from the following: [3]		Var.
ECE 495A	Independent Study	
ECE 495B	Independent Study: Open Option Project	
ECE 495C	Independent Study: Vertically Integrated Projects	
ECE 503	Ultrafast Optics	3
ECE 504	Physical Optics	3
ECE 505	Nanostructures: Fundamentals and Applications	3
ECE 506	Optical Interferometry and Laser Metrology	3
ECE 507	Plasma Physics and Applications	3
ECE 517/BIOM 517	Advanced Optical Imaging	3
ECE 518/BIOM 518	Biophotonics	3
ECE 526/BIOM 526	Biological Physics	3
ECE 527B/ BIOM 527B	Biosensing: Signal and Noise in Biosensors	1
ECE 527F/ BIOM 527F	Biosensing: Biophotonic Sensors Using Refractive Index	1
ECE 546	Laser Fundamentals and Devices	3
ECE 572	Semiconductor Transistors	1
ECE 573	Semiconductor Optoelectronics Laboratory	3
ECE 574	Optical Properties in Solids	3
MATH 419	Introduction to Complex Variables	3
PH 315	Modern Physics Laboratory	2
PH 425	Advanced Physics Laboratory	2
PH 452	Introductory Quantum Mechanics II	3
PH 462	Statistical Physics	3

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

2 Project must be a laser and optical engineering topic.

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