

# MAJOR IN COMPUTER ENGINEERING, EMBEDDED AND IOT SYSTEMS CONCENTRATION

## Major Completion Map

### Distinctive Requirements for Degree Program:

**TO PREPARE FOR FIRST SEMESTER:** The curriculum for this major assumes students enter college prepared to take calculus.

The ECE curriculum has been modified as part of the Revolutionizing Engineering Departments initiative (RED). Three threads run through the new curriculum: Foundations, Creativity and Professional Formation

of Engineers. This new curriculum incorporates skills that engineers need beyond technical expertise, in areas like communication, ethics, social impact and interaction in large, diverse groups. The ECE department requires that students also complete the following three Career Development Seminars: 1) Resume Writing; 2) Behavior Based Interviewing; and 3) Using LinkedIn™.

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

Semester 1		Critical	Recommended	AUCC	Credits
CO 150	College Composition (GT-CO2)		X	1A	3
CS 163 or 164	CS1—No Prior Programming Experience CS1—Computational Thinking with Java	X			4
ECE 102	Digital Circuit Logic	X			4
MATH 160	Calculus for Physical Scientists I (GT-MA1)	X		1B	4
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>15</b>
Semester 2		Critical	Recommended	AUCC	Credits
CS 165	CS2—Data Structures	X			4
ECE 251	Introduction to Microcontrollers and IoT	X			4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	X		1B	4
Diversity, Equity, and Inclusion ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion</a> )		X		1C	3
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>15</b>

### Sophomore

Semester 3		Critical	Recommended	AUCC	Credits
CS 220	Discrete Structures and their Applications	X			4
ECE 103	DC Circuit Analysis	X			3
MATH 261	Calculus for Physical Scientists III	X			4
PH 141	Physics for Scientists and Engineers I (GT-SC1)	X		3A	5
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>16</b>
Semester 4		Critical	Recommended	AUCC	Credits
ECE 202	Circuit Theory Applications	X			4
ECE 232	Introduction to Project Practices	X			1
ECE 303/ STAT 303	Introduction to Communications Principles	X			3
MATH 340	Intro to Ordinary Differential Equations	X			4
Department Approved Science (See List on Requirements Tab)			X	3A	3
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>15</b>

<b>Junior</b>					
<b>Semester 5</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
CS 253	Software Development with C++	X			4
ECE 311	Linear System Analysis I	X			3
ECE 450	Digital System Design Laboratory	X			1
ECE 451	Digital System Design	X			3
Select one course from the following:					3
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)		X	2	
JTC 300	Strategic Writing and Communication (GT-CO3)		X	2	
Computer Engineering Electives (see list below) and Technical Electives (see list below)		X			3
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>17</b>
<b>Semester 6</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
CS 356	Systems Security	X			3
ECE 452	Computer Organization and Architecture	X			3
ECON 202	Principles of Microeconomics (GT-SS1)		X	3C	3
Select a minimum of three credits from the following:					3
DSCI 369	Linear Algebra for Data Science	X			
MATH 369	Linear Algebra I	X			
Historical Perspectives ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )			X	3D	3
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>15</b>
<b>Senior</b>					
<b>Semester 7</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
ECE 401	Senior Design Project I	X		4A,4B	3
Choose one of the following:					4
ECE 528/ CS 528	Embedded Systems and Machine Learning				
Technical Electives (See List on Requirements Tab)		X			
Technical Electives (See List on Requirements Tab)		X			6
Arts and Humanities ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities</a> )		X		3B	3
Career Development Seminar(s)			X		
<b>Total Credits</b>					<b>16</b>
<b>Semester 8</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
CS 320	Algorithms–Theory and Practice	X			3
ECE 402	Senior Design Project II	X		4C	3
Choose one of the following:					4
ECE 456	Computer Networks				
Technical Electives (See List on Requirements Tab)					
Technical Electives (See List on Requirements Tab)		X			4
Arts and Humanities ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities</a> )		X		3B	3
The benchmark courses for the 8th semester are the remaining courses in the entire program of study.		X			
<b>Total Credits</b>					<b>17</b>
<b>Program Total Credits:</b>					<b>126</b>