

**Computer Engineering - VLSI (Very Large Scale Integration) and Integrated Circuits Concentration**

Degree requirements - 126 credits

Fall - 14 credits		Credits	Spring - 15 credits		Credits	
<b>FIRST YEAR</b>	ECE102	Digital Circuit Logic (F,S)	4	ECE251	Introduction to Microcontrollers and IoT (F,S; ECE102 with a C or higher)	4
	MATH160 Fulfills AUCC Category 1B	Calculus for Physical Scientists I (F,S,SS; MATH124 with a B or higher; MATH126 with a B or higher or MATH127 with a B or higher)	4	MATH161	Calculus for Physical Scientists II (F,S,SS; MATH124 or MATH127; MATH159 or MATH160)	4
	CS150B <sup>1</sup> Fulfills AUCC Category 3B	Culture and Coding: Python (F,S)	3	CS164 <sup>1</sup>	CS1 - Computational Thinking with Java (F,S; CS150B with a B or higher or CS152 with a B or higher or CS163)	4
	CO150 <sup>2</sup> Fulfills AUCC Category 1A	College Composition (F,S,SS; CO130 or Placement)	3	University Core	AUCC Category 1C, 3B, 3D (F,S,SS)	3

Fall - 16 credits		Credits	Spring - 17 credits		Credits	
<b>SECOND YEAR</b>	ECE103	DC Circuit Analysis (F,S; MATH159 with a C or higher or MATH160 with a C or higher)	3	ECE202	Circuit Theory Applications (S,SS; ECE103 with a C or higher; MATH161 with a C or higher)	4
	CS165	CS2 - Data Structures (F,S; CS162 with a C or higher or CS163 with a C or higher or CS164 with a C or higher)	4	ECE303	Introduction to Communications Principles (S; MATH261 with a C or higher; MATH340, may be taken concurrently)	3
	PH141 Fulfills AUCC Category 3A	Physics for Scientists and Engineers I (F,S,SS; MATH126; MATH159, may be taken concurrently or MATH160, may be taken concurrently)	5	PH142 Fulfills AUCC Category 3A	Physics for Scientists and Engineers II (F,S,SS; PH141; MATH161, may be taken concurrently)	5
	MATH261	Calculus for Physical Scientists III (F,S,SS; MATH161)	4	MATH340	Introduction to Ordinary Differential Equations (F,S,SS; MATH261)	4
				ECE232	Introduction to Project Practices (F,S; ECE202, may be enrolled concurrently or ECE395B, may be enrolled concurrently)	1

Fall - 18 credits		Credits	Spring - 16 credits		Credits	
<b>THIRD YEAR</b>	ECE311	Linear Systems Analysis I (F; ECE202 with a C or higher; MATH340 with a C or higher; ECE451 or ECE528 or CS356, may be taken concurrently)	3	MATH369 or DSCI369	Linear Algebra I (F,S,SS; MATH 161) or Linear Algebra for Data Science (S; MATH159 or MATH160 or MATH161)	3-4
	ECE331	Electronics Principles I (F; ECE202 with a C or higher; MATH340 with a C or higher; PH142 with a C or higher; ECE311, may be taken concurrently; ECE451 or ECE528 or CS356, may be taken concurrently)	4	ECE332	Electronic Principles II (S; ECE331 with a C or higher)	4
	ECE450 and ECE451	Digital Systems Design Lab (F; concurrent registration in ECE451) and Digital Systems Design (F; ECE102 with a C or higher; ECE202 with a C or higher; concurrent registration in ECE450)	4	ECE452	Computer Organization & Architecture (S; ECE251 with a C or higher)	3
	CS220	Discrete Structures and their Applications (F,S; CS150B or CS152 with a B or higher OR CS162 or CS163 or CS164 with a C or higher; MATH160)	4	ECON202 Fulfills AUCC Category 3C	Microeconomics (F,S,SS; MATH117 or MATH118 or MATH160)	3
	CO301B or JTC300 Fulfills AUCC Category 2	Writing in the Disciplines-Sciences (F,S; CO150 or HONR193) or Strategic Writing and Communication (F,S,SS; CO150 or HONR193)	3	CS214	Software Development (F,S; CS165 with a C or higher)	3

Fall - 15-16 credits		Credits	Spring - 14-15 credits		Credits	
<b>FOURTH YEAR</b>	ECE401 Fulfills AUCC Category 4	Senior Design Project I (F,S; ECE311 with a C or higher; 4 courses from ECE452, ECE456, ECE451, ECE528, CS356, ECE312 with a C or higher, ECE331 with a C or higher, ECE332 with a C or higher)	3	ECE402 Fulfills AUCC Category 4	Senior Design Project II (F,S; ECE401)	3
	ECE340	Electromagnetics for Computer Engineering (F; ECE202 with a C or higher; MATH161 with a C or higher)	3	ECE456	Computer Networks (S; ECE251 with a C or higher; ECE303 with a C or higher; CS152 or CS162 or CS163 or CS164 with a C or higher; ECE311 with a C or higher)	4
	CS356 or ECE/CS528	System Security (F,S; CS214 with a C or higher or CS253 with a C or higher or CS370 with a C or higher) or Embedded Systems and Machine Learning (F; ECE251 with a C or higher) Strongly Recommended: ECE/CS528	3-4	Computer Engineering Electives <sup>3</sup> and Technical Electives <sup>3</sup>	See Approved List (F,S) Strongly Recommended: ECE571 VLSI System Design (S; ECE451)	7-8
	University Core	AUCC Category 1C, 3B, 3D (F,S,SS)	6			

<sup>1</sup> Students may also choose one of the following: 1) Arts/Humanities AUCC + CS152 + CS162; or 2) Arts/Humanities AUCC + CS163

<sup>2</sup> College Composition must be completed within the first 60 (CSU and transfer) credits taken

<sup>3</sup> See list of approved courses on the ECE website: <https://www.engr.colostate.edu/ece/undergraduates/degree-programs/computer-engineering-with-vlsi-and-integrated-circuits/>

ECE courses required for the major at the 100, 200, and 300 level must be passed with a minimum grade of C; 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.