COMPUTER ENGINEERING - MINOR

The minor in computer engineering provides training in computer engineering beyond the training usually received by science and mathematics majors. It can also broaden the training of students majoring in other engineering and applied science fields to provide more depth in computer engineering. The goal is to introduce students to the fundamentals of computer engineering and introduce them to a more advanced field. Such skills are important to students who expect to participate in real world situations that increasingly involve computer engineering solutions.

Requirements

The computer engineering minor requires a minimum of 20 credit hours.

A minor in computer engineering can be earned in conjunction with any CU Boulder major, except for BS degrees in electrical engineering, electrical & computer engineering and integrated design engineering-electrical emphasis. The computer engineering minor cannot be completed alongside the following minors: computer science, electrical engineering and signals & systems engineering.

Prerequisites

Students must complete one of these computing courses with a C- or higher before declaring the minor: ECEN 1310, CSCI 1300, ASEN 1320, APPM 3050, PHYS 2600 or similar.

Grade Requirements

A minimum cumulative GPA of 2.000 is required in the courses used to satisfy the minor requirements. Each individual course that is counted toward this minor must be passed with a grade of D- or higher (note that a minimum grade of C- is required in all prerequisite courses).

Residency Requirements

At least 9 credit hours for the minor must be taken on the CU Boulder campus.

Required Courses and Credits

Code	Title	Credit Hours
Required Courses		
CSCI 2270	Computer Science 2: Data Structures	4
or CSCI 2275	Programming and Data Structures	
ECEN 2350	Digital Logic	4
ECEN 2360	Programming Digital Systems	3
or CSCI 2400	Computer Systems	
ECEN 2370	Embedded Software Engineering	3
ECEN/CSCI 3593	Computer Organization	3
Emphasis Area		
Choose one:		3
ECEN 2250	Introduction to Circuits and Electronics	
ECEN 2260	Circuits as Systems	
ECEN 2270	Electronics Design Lab	
ECEN 2410	Renewable Sources and Efficient Electrical Energy Systems	
ECEN 2420	Electronics for Wireless Systems	
ECEN 2440	Application of Embedded Systems	
ECEN 2450	Electronic and Semiconductor Device Laboratory	
ECEN 3250	Microelectronics	
ECEN 3300	Linear Systems	
or ECEN 3301	Biomedical Signals and Systems	
ECEN 3303/ CSCI 3302	Introduction to Robotics	
ECEN 3320	Semiconductor Devices	
ECEN 3400	Electromagnetic Fields and Waves	
ECEN 3730	Practical Printed Circuit Board Design and Manufacture	
ECEN 3753	Real-Time Operating Systems	
or CSCI 3753	Design and Analysis of Operating Systems	
ECEN 3763	FPGA Design and HDL	
ECEN 3915	Foundations of Quantum Engineering	
ECEN 4111	Engineering Applications in Biomedicine: Cardiovascular Devices and Systems	
ECEN 4133	Fundamentals of Computer Security	
ECEN/MCEN 4138	Control Systems Analysis	
ECEN 4224	High Speed Digital Design	
ECEN 4395	Organic Electronic Materials and Devices	
ECEN 4313	Concurrent Programming	
ECEN 4322/5322	Data and Network Science	
ECEN 4553/ CSCI 4555	Compiler Construction	
ECEN 4693/5593/ CSCI 5593	Advanced Computer Architecture	
ECEN 4763	Embedded Software Algorithms	
ECEN 4925	Foundations of Quantum Hardware	
ECEN 4933	Engineering Genetic Circuits	
ECEN 5139	Computer-Aided Verification	
Total Credit Hours		**20**