

COMPUTER ENGINEERING PROGRAM

The program in Computer Engineering consists of the Engineering Core, the Computer Engineering Core, and one of four option choices plus 3 credits in general electives. The normal length of the program is 120 credits.

Credits	Course	Engineering Core	Prerequisite	Co-requisite
3.50	ELEC 273	Basic Circuit Analysis	PHYS 205	ENGR 213
3.00	ENCS 282	Technical Writing and Communication	Students must pass the Engineering Writing Test (EWT), or pass ENCS 272 with a grade of C- or higher	
1.50	ENGR 201	Professional Practice and Responsibility		
1.50	ENGR 202	Sustainable Development and Environmental Stewardship		
3.00	ENGR 213	Applied Ordinary Differential Equations	MATH 205	MATH 204
3.00	ENGR 233	Applied Advanced Calculus	MATH 204, 205	
3.00	ENGR 301	Engineering Management Principles and Economics		
3.00	ENGR 371	Probability and Statistics in Engineering	ENGR 213, 233	
3.00	ENGR 391	Numerical Methods in Engineering	ENGR 213, 233; COEN 243	
3.00	ENGR 392	Impact of Technology on Society	ENCS 282; ENGR 201, 202	
27.50	Total			
Credits	Course	Computer Core	Prerequisite	Co-requisite
3.50	COEN 212	Digital Systems Design I	MATH 204	
3.00	COEN 231	Introduction to Discrete Mathematics	MATH 204	
3.50	COEN 243	Programming Methodology I	MATH 204	
3.00	COEN 244	Programming Methodology II	COEN 243	
3.50	COEN 311	Computer Organization and Software	COEN 212, 243	
3.50	COEN 313	Digital Systems Design II	COEN 212, 231	
3.50	COEN 316	Computer Architecture and Design	COEN 311, 313	
3.50	COEN 317	Microprocessor-Based Systems	COEN 311, 313	
3.00	COEN 320	Introduction to Real Time Systems	COEN 346 or COMP 346	
3.50	COEN 346	Operating Systems	COEN 311; COMP 352 or COEN 352	
3.00	COEN 352	Data Structures and Algorithms	COEN 231, 244	
3.50	COEN 366	Communication Networks and Protocols	COEN 346	
3.00	COEN 390	Computer Engineering Product Design Project	Minimum of 45 credits in BEng (Computer); COEN 311, 352; ENGR 290	
4.00	COEN 490	Capstone Electrical Engineering Design Project	Minimum of 75 credits in BEng (Computer) or permission of the Department; ENGR 301, 371; COEN 390; SOEN 341; completion of I work term	
3.00	ELEC 242	Continuous-Time Signals and Systems	ELEC 273; ENGR 213	
3.50	ELEC 311	Electronics I	ELEC 273	
3.50	ELEC 342	Discrete-Time Signals and Systems	ELEC 242 or 264	
3.50	ELEC 372	Fundamentals of Control Systems	ELEC 242 or 364	
3.00	ENGR 290	Introductory Engineering Team Design Project	ENCS 282; ENGR 213, 233	
3.00	SOEN 341	Software Process and Practices	COMP 352 or COEN 352 previously or concurrently	ENCS 282
6.00		Science Electives - (Section 71.30.2 in Undergraduate Calendar) - see list below	If a student takes 6.5 credits, the additional 0.5 credits will be counted towards the credits in Computer Engineering Electives list.	
72.50	Total			
Credits	Science Electives		Prerequisite	
3.00	BIOL 206	Elementary Genetics		
3.00	BIOL 261	Molecular and General Genetics	BIOL 201 or 301 or CHEM 205 or 206	
3.00	BIOL 266	Cell Biology	BIOL 201 or 301 or CHEM 205 or 206	
3.00	CHEM 217	Introductory Analytical Chemistry I	CHEM 205, 206; PHYS 204, 206, 226; MATH 203, 205; or equivalents	
3.00	CHEM 221	Introductory Organic Chemistry I	CHEM 205, 206	
3.50	ELEC 321	Introduction to Semiconductor Materials and Devices	CHEM 205; ENGR 213	
3.00	MIAE 221	Materials Science	MATH 204	
3.00	PHYS 252	Optics	PHYS 206	
3.00	PHYS 284	Introduction to Astronomy		
3.00	PHYS 367	Modern Physics and Relativity	PHYS 205, 206 or equivalent	
3.00	PHYS 443	Quantitative Human Systems Physiology		
3.00	PHYS 445	Principles of Medical Imaging		
Credits	Options	Technical Electives Options	Description	
		Students who have taken 3-credit version of COEN 243 can take 0.5 credits extra from Computer Engineering elective list. Instead of 17 credits you will complete 17.50 credits.		
17.00	Option I	Biological and Biomedical Engineering (BME) Option	Student must complete a minimum of 17 credits of electives taken from Biological Option Electives and the Computer Engineering list. At least 15 credits must be taken from the Biological and Biomedical Engineering Option Electives. At least 2 courses must be chosen from the 4 courses: COEN 433, 434, ELEC 444, 445. Not more than one science course (BIOL or PHYS) may be taken.	
17.00	Option II	Pervasive Computing Option	Student must complete a minimum of 17 credits of electives taken from Pervasive Computing Option Electives and the Computer Engineering Electives list. At least 15 credits must be taken from the Pervasive Computing Option Electives. At least 2 courses must be chosen from the 4 courses: COEN 421, 422, 424 and COEN 446.	
17.00	Option III	General Stream	3 credits taken from General Stream Electives List. Remaining 14 credits taken from Computer Engineering Electives List	
Credits		General Electives	Description	
3.00		General Education Elective or General Electives	Taken from section 71.110 in the Undergraduate Calendar	

*Note: Students may replace COEN 490 with ENGR 490 if they are interested in a multidisciplinary project that requires collaboration with students from other engineering departments. In order for students to register in ENGR 490, their projects must be approved by the ENGR 490 Design Committee before the start of the fall term.