

# COMPUTER ENGINEERING

<i>Fall Quarter</i>	<i>Units</i>	<i>Winter Quarter</i>	<i>Units</i>	<i>Spring Quarter</i>	<i>Units</i>
<b>FIRST YEAR</b>					
CS 010 <sup>1</sup> <i>C++ Programming I</i>	4	CS 012 <sup>2</sup> or CS 13 <i>C++ Programming II</i>	4	CS 061 <i>Machine Org. &amp; Assembly Lang. Prog.</i>	4
ENGL 001A <i>Beginning Composition</i>	4	ENGL 001B <i>Intermediate Composition</i>	4	MATH 009C <i>First Year Calculus</i>	4
ENGR 001G <i>Professional Dev. &amp; Mentoring</i>	1	MATH 009B <i>First Year Calculus</i>	4	MATH/CS 011 <i>Intro to Discrete Structures</i>	4
MATH 009A <i>First Year Calculus</i>	4	PHYS 040A <i>Physics (Mechanics)</i>	5	PHYS 040B <i>Physics (Heat/Waves/Sound)</i>	5
<b>SECOND YEAR</b>					
CS 014 <i>Intro to Data Structures &amp; Algorithms</i>	4	EE 001B <i>Engineering Circuit Analysis II and Lab</i>	4	CS 100 <i>Software Construction</i>	4
EE 001A and EE 01LA <i>Engineering Circuit Analysis I and Lab</i>	4	EE/CS 120A <i>Logic Design</i>	5	CS/EE 120B <i>Embedded Systems</i>	4
MATH 046 <i>Differential Equations</i>	4	MATH 010A <i>Multivariable Calculus</i>	4	EE 020 <i>Linear Methods for Engr. Analysis</i>	4
PHYS 040C <i>Physics (Electricity/Magnetism)</i>	5	CS 111 <i>Discrete Structures</i>	4	Engineering Elective <sup>3</sup> _____	4
<b>THIRD YEAR</b>					
CS 141 <i>Interm. Data Structures &amp; Algorithms</i>	4	CS 161 & CS 161L <i>Design &amp; Arch. of Comp. Sys. and Lab</i>	6	CS 153 <i>Design of Operating Systems</i>	4
ENGR 180W* <i>Technical Communications</i>	4	EE/CS 168 <i>VLSI Design</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4
ENGR 101G <i>Professional Dev. &amp; Mentoring</i>	1	Breadth _____ <i>Biological Sciences</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4
EE 100A <i>Electronic Circuits</i>	4				
<b>FOURTH YEAR</b>					
CS 122A or EE 128 <i>Micro Design or Instrumentation</i>	5	Technical Elective** _____	4	Technical Elective** _____	4
Technical Elective** _____	4	Technical Elective** _____	4	Technical Elective** _____	4
STAT 155 <sup>4</sup> <i>Prob., Random Variables &amp; Processes</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4
Breadth _____ <i>Humanities/Social Sciences</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4		

To earn a B.S., you must complete all College and University requirements. For a complete list: [www.catalog.ucr.edu](http://www.catalog.ucr.edu).

**ENGLISH COMPOSITION\***

A C or better is required in three quarters of English Composition courses to satisfy the graduation requirement. ENGR 180W fulfills the third quarter of English Composition.

**BREADTH REQUIREMENTS**

For an approved list of Breadth courses: <http://student.engr.ucr.edu/policies/requirements/breadth.html>.

Humanities: (3 courses)

- A. World History: \_\_\_\_\_
  - B. Fine Arts, Lit., Phil. or Rlst: \_\_\_\_\_
  - C. Human Persp. on Science: \_\_\_\_\_
- Social Sciences: (3 courses)
- A. Econ. or Posc.: \_\_\_\_\_
  - B. Anth., Psyc, or Soc.: \_\_\_\_\_
  - C. General Social Science: \_\_\_\_\_
- Biological Science \_\_\_\_\_

Ethnicity: (1 course)

- 1. \_\_\_\_\_
- Upper Division: (2 courses)
- 1. \_\_\_\_\_
  - 2. \_\_\_\_\_

**TECHNICAL ELECTIVES \*\***

Please note that Technical Electives may be offered throughout the Academic Year. Consult with your Academic Advisor about potential offerings.

Course Plan is subject to change.

<sup>1</sup> CS 010V may be used to satisfy this requirement

<sup>2</sup> CS 012V may be used to satisfy this requirement

<sup>3</sup> Select in consultation with Faculty Advisor

<sup>4</sup> EE 114 may be used to satisfy this requirement

## Computer Engineering Technical Electives

You must complete five courses (at least 20 units) as technical electives from the following set of Computer Science and Engineering and Electrical Engineering upper-division courses. The technical electives selected must include either CS 179 (E-Z) or EE 175A, EE 175B and EE 175C. The remaining technical electives must include at least one coherent sequence of two classes from either Computer Science and Engineering or Electrical Engineering. The technical electives must be distinct from those used to satisfy major requirements. Units are listed in ().

CS 122A	Intermediate Embedded & Real-Time Systems (5)	EE 100B	Electronic Circuits (4)
CS 122B	Advanced Embedded & Real-Time Systems (5)	EE 105	Modeling and Simulation of Dynamic Systems (4)
CS 130	Computer Graphics (4)	EE 110A	Signals and Systems (4)
CS 133	Computational Geometry (4)	EE 110B	Signals and Systems (4)
CS 150	Theory of Automata and Formal Languages (4)	EE 115	Introduction to Communication Systems (4)
CS 152	Compiler Design (4)	EE 128	Data Acquisition, Instrum., & Process Control (4)
CS 160	Concurrent Programming & Parallel Systems (4)	EE 132	Automatic Control (4)
CS 162	Computer Architecture (4)	EE 133	Solid-State Electronics (4)
CS 164	Computer Networks (4)	EE 134	Digital Integrated Circuit Layout and Design (4)
CS 165	Computer Security (4)	EE 135	Analog integrated Circuit Layout and Design (4)
CS 166	Database Management Systems (4)	EE 136	Semiconductor Device Processing (4)
CS 169	Mobile Wireless Networks (4)	EE 140	Computer Visualization (4)
CS 170	Introduction to Artificial Intelligence (4)	EE 141	Digital Signal Processing (4)
CS 171	Intro to Machine Learning & Data Mining (4)	EE 144	Introduction to Robotics (4)
CS 172	Introduction to Information Retrieval (4)	EE 146	Computer Vision (4)
CS 177	Modeling & Simulation (4)	EE 150	Digital Communication (4)
CS 179 E-Z	Project in Computer Science (4 units maximum)	EE 151	Introduction to Digital Control (4)
CS 180	Introduction to Software Engineering (4)	EE 152	Image Processing (4)
CS 181	Principles of Programming Languages (4)	EE 175A	Senior Design Project (3)
CS 183	UNIX System Administration (4)	EE 175B	Senior Design Project (4)
CS 193	Design Project (4 units maximum)	EE 175C	Senior Design Project (1)