

# COMPUTER SCIENCE

Fall Quarter	Units	Winter Quarter	Units	Spring Quarter	Units
<b>FIRST YEAR</b>					
CS 010A <i>C++ Programming I</i>	4	CS 010B <i>C++ Programming II</i>	4	CS 010C <i>Intro to Data Structures &amp; Algorithms</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 001I <i>Professional Dev. &amp; Mentoring</i>	1	MATH 009B <i>First Year Calculus</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4
MATH 009A <i>First Year Calculus</i>	4	MATH/CS 011 <i>Intro to Discrete Structures</i>	4		
<b>SECOND YEAR</b>					
CS 061 <i>Machine Org. &amp; Assembly Lang. Prog.</i>	4	EE/CS 120A <i>Logic Design</i>	5	CS/EE 120B <i>Embedded Systems</i>	4
CS 100 <i>Software Construction</i>	4	CS 111 <i>Discrete Structures</i>	4	PHYS 040C <i>Physics (Electricity/Magnetism)</i>	5
PHYS 040A <i>Physics (Mechanics)</i>	5	PHYS 040B <i>Physics (Heat/Waves/Sound)</i>	5	Breadth _____ <i>Humanities/Social Sciences</i>	4
Breadth _____ <i>Humanities/Social Sciences</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4		
<b>THIRD YEAR</b>					
CS 141 <i>Interm. Data Structures &amp; Algorithms</i>	4	CS 150 <i>Theory of Automata &amp; Formal Language</i>	4	Engineering Elective <i>EE030A&amp;30LA or EE 005, or MATH 046, or ME 009, or ME 010</i>	4
CS 161 <i>Design &amp; Architec. of Comp. Sys. &amp; Lab</i>	4	MATH 031 or EE 020B <i>Applied Linear Algebra</i>	5	ENGR 180W* <i>Technical Communications</i>	4
MATH 010A <i>Multivariable Calculus</i>	4	Technical Elective** _____	4	CS 153 <i>Design of Operating Systems</i>	4
Breadth _____ <i>Humanities/Social Sciences</i>	4	ENGR 101I <i>Professional Dev. &amp; Mentoring</i>	1		
<b>FOURTH YEAR</b>					
CS 179(E-Z) or CS 178A* <i>Proj in Comp Sc or Proj Seq in CSE</i>	4	CS 178B* or Technical Elective** <i>Proj Seq in CSE or Technical Elect</i>	4	Technical Elective** _____	4
Technical Elective** _____	4	Technical Elective** _____	4	Technical Elective** _____	4
STAT 155 <i>Probability &amp; Statistics for Engr</i>	4	CS 152 <i>Compiler Design</i>	4	Technical Elective** _____	4
Breadth _____ <i>BIOL 002, or 003, or 005A/LA</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4		

Total Units: 175

To earn a B.S., you must complete all College and University requirements. For a complete list: [catalog.ucr.edu](http://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., Psys, 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. Proposed offerings may be found at: <http://www.cs.ucr.edu/education/undergraduate/courses/>. See approved technical electives on back.

Course Plan is subject to change.

## Computer Science Technical Electives

You must complete seven (7) courses (at least 28 units) of Technical Electives chosen from the list below. At least four (4) Technical Electives must be from Computer Science courses.

Course	Course Title (Units)	CS 180	Introduction to Software Engineering (4)
CS 105	Data Analysis Methods (4)	CS 181	Principles of Programming Languages (4)
CS 110	Web Development (4)*	CS 182	Software Testing and Verification (4)
CS 122A	Intermed. Embedded & Real-Time Sysys (5)	CS 183	UNIX System Administration (4)
CS 122B	Adv. Embedded & Real-Time Systems (5)	CS 193	Design Project (4 units maximum)
CS 130	Computer Graphics (4)	MATH 120	Optimization (4)
CS 133	Computational Geometry (4)	MATH 126	Combinatorics (4)
CS 134	Video Game Creation & Design (4)	MATH 135A	Numerical Analysis (4)
CS 135	Virtual Reality (4)	MATH 135B	Numerical Analysis (4)
CS 142	Algorithm Engineering (4)*	PHIL 124	Formal Logic (4)
CS 144	Algorithms for BioInformatics (4)*		
CS 145	Combinatorial Optimization Algorithms (4)		
CS 147	GPU Programming (4)		
CS 160	Concurrent Programming & Parallel Systems (4)		
CS 162	Computer Architecture (4)		
CS 164	Computer Networks (4)		
CS 165	Computer Security (4)		
CS 166	Database Management Systems (4)		
CS 167	Intro to BIG-DATA Management (4)*		
CS/EE 168	Introduction to Very Large Scale Integration (VLSI) Design (4)		
CS 169	Mobile Wireless Networks (4)		
CS 170	Introduction to Artificial Intelligence (4)		
CS 171	Introduction to Machine Learning and Data Mining (4)		
CS 172	Introduction to Information Retrieval (4)		
CS 173	Intro to Natrual Language Processing (NPL) (4)		
CS 175	Entrepreneurship in Computing (4)		
CS 177	Modeling & Simulation (4)		
CS 179 E-Z	Project in Computer Science (4 units maximum)		

\*Technical Electives not in the Catalog for 2020-2021