COMPUTER SCIENCE

Catalog Year: 2022

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

Total Units to Graduate 180

Maximum Units: 220

To earn a B.S., you must complete all College and University requirements. For a complete list: 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. 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 105	Data Analysis Methods (4)	CS 170	Introduction to Artificial Intelligence (4)
CS 108	Data Science Ethics (4)	CS 171	Introduction to Machine Learning and Data Mining (4)
CS 110	Web Development (4)	CS 172	Introduction to Information Retrieval (4)
CS 120B	Intro to Embedded Systems (4)	CS 173	Intro to Natrual Language Processing (NPL) (4)
CS 122A	Intermed. Embedded & Real-Time Systs (5)	CS 175	Entrepreneurship in Computing (4)
CS 122B	Adv. Embedded & Real-Time Systems (5)	CS 177	Modeling & Simulation (4)
CS 130	Computer Graphics (4)	CS 179F	Project in CS: Operating Systems (4)
CS 131	Edge Computing	CS 179G	Project in CS: Database Systems (4)
CS 133	Computational Geometry (4)	CS 179I	Project in CS: Networks (4)
CS 134	Video Game Creation & Design (4)	CS 179J	Project in CS: Computer Architecture and Embedded Systems (4)
CS 135	Virtual Reality (4)	CS 179M	Project in CS: Artificial Intelligent Systems (4)
CS 142	Algorithm Engineering (4)	CS 179N	Project in CS: Graphics and Electronic Games (4)
CS 144	Algorithms for BioInformatics (4)	CS 180	Introduction to Software Engineering (4)
CS 145	Combinatorial Optimization Algorithms (4)	CS 181	Principles of Programming Languages (4)
CS 147	GPU Programming (4)	CS 182	Software Testing and Verification (4)
CS 160	Concurrent Programming & Parallel Systems	CS 183	UNIX System Administration (4)
CS 162	Computer Architecture (4)	CS 193	Design Project (4 units maximum)
CS 164	Computer Networks (4)	MATH 120	Optimization (4)
CS 165	Computer Security (4)	MATH 126	Combinatorics (4)
CS 166	Database Management Systems (4)	MATH 135A	Numerical Analysis (4)
CS 167	Intro to BIG-DATA Management (4)	MATH 135B	Numerical Analysis (4)
CS/EE 168	Introduction to Very Large Scale Integration	PHIL 124	Formal Logic (4)
CS 169	Mobile Wireless Networks (4)		