UCR Marlan and Rosemary Bourns College of Engineering

COMPUTER SCIENCE

Revised December 2023

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	CS 153	4
Interm. Data Structures & Algorithms		*Theory of Automata & Formal Language*		*Design of Operating Systems*	
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	Technical Elective**	4
Multivariable Calculus		_____		_____	
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*		_____	
ENGR Course Outside CS	4	Breadth _____	4		
EE030A&30LA or EE 005, or MATH 046, or ME 009, or ME 010		*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: https://www1.cs.ucr.edu/undergraduate/course-listings . See approved technical electives on back.

Course Plan is subject to change.

Computer Science Technical Electives

You must complete eight (8) courses (at least 32 units) of Technical Electives chosen from the list below. At least four (4) Technical Electives must be from Computer Science courses. ***If a student has taken CS 178A and CS 178B project sequence, an additional CS 179 (E-Z) cannot be taken to satisfy a Technical Elective. Only 4-units of CS 179 (E-Z) or CS 178B will count towards a Technical Elective.***

Course	Course Title (Units)	Course	Course Title (Units)
CS 105	Data Analysis Methods (4)	CS 171/EE 142	Introduction to Machine Learning and Data Mining (4)
CS 108	Data Science Ethics (4)	CS 172	Introduction to Information Retrieval (4)
CS 110	Web Development (4)	CS 173	Intro to Natrual Language Processing (NPL) (4)
CS/EE 120B	Intro to Embedded Systems (4)	CS 175	Entrepreneurship in Computing (4)
CS 122A	Intermed. Embedded & Real-Time Systs (5	CS 177	Modeling & Simulation (4)
CS 122B	Adv. Embedded & Real-Time Systems (5)	CS 178B	Project Sequence in CSE (4)
CS 130	Computer Graphics (4)	CS 179E	Project in CS: Compilers (4)
CS 131	Edge Computing	CS 179F	Project in CS: Operating Systems (4)
CS 133	Computational Geometry (4)	CS 179G	Project in CS: Database Systems (4)
CS 134	Video Game Creation & Design (4)	CS 179I	Project in CS: Networks (4)
CS 135	Virtual Reality (4)	CS 179J	Project in CS: Computer Architecture and Embedded Systems (4)
CS 142	Algorithm Engineering (4)	CS 179K	Project in CS: Sofware Engineering (4)
CS 144	Algorithms for BioInformatics (4)	CS 179M	Project in CS: Artificial Intelligent Systems (4)
CS 145	Combinatorial Optimization Algorithms (4)	CS 179N	Project in CS: Graphics and Electronic Games (4)
CS/EE 147	GPU Programming (4)	CS 180	Introduction to Software Engineering (4)
CS 160	Concurrent Programming & Parallel Syster	CS 181	Principles of Programming Languages (4)
CS 162	Computer Architecture (4)	CS 182	Software Testing and Verification (4)
CS 164	Computer Networks (4)	CS 183	UNIX System Administration (4)
CS 165	Computer Security (4)	CS 193	Design Project (4 units maximum)
CS 166	Database Management Systems (4)	MATH 120	Optimization (4)
CS 167	Intro to BIG-DATA Management (4)	MATH 126	Combinatorics (4)
CS/EE 168	Introduction to Very Large Scale Integratio	MATH 135A	Numerical Analysis (4)
CS 169	Mobile Wireless Networks (4)	MATH 135B	Numerical Analysis (4)
CS 170	Introduction to Artificial Intelligence (4)	PHIL 124	Formal Logic (4)

Computer Science Course Details

ENGR 001I: Required for first year students. Offered **ONLY** in Fall quarter. ENGR 001I is waived for transfer students.

ENGR 101I: For Junior standing. Offered **ONLY** in Winter quarter.

CS 161: Computer Science major students are only required to complete CS 161. Note that CS 161L is not a major requirement.

Project in Computer Science: Students can either complete CS 178A & CS 178B or one course in CS 179 (E-Z) to satisfy the Project in CS requirement.

Project in Computer Science: ENGR 180W is a prerequisite to all CS project courses. There are additional course prerequisites. Please be sure to check.

CS 178A & CS 178B: This is the CS two quarter project sequence. CS 178A will satisfy the Project in Computer Science area of your degree audit and CS 178B will count as a Technical Elective.

ENGR 180W: Students must enroll in the corequisite of ENGL 007 (.5 units).