# Suggested Course Plan for a UC Riverside Major in COMPUTER SCIENCE

**Catalog Year: 2022**

## Fall Quarter | Units | Winter Quarter | Units | Spring Quarter | Units |
---|---|---|---|---|---|
CS 010A | 4 | CS 010B | 4 | CS 010C | 4 |
CS 010B | 4 | CS 010C | 4 | 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 |
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 | |
Design & Architec. of Comp. Sys. & Lab | Applied Linear Algebra |
MATH 010A | 4 | Technical Elective** | 4 | Technical Communications |
Multivariable Calculus | |
Breadth | 4 | ENGR 101I | 1 | Design of Operating Systems |
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 |
____ | 4 | ____ | 4 | |
Breadth | 4 | CS 152 | 4 | Technical Elective** | 4 |
BIOL 002, or 003, or 005A/LA | Compiler Design |
Breadth | 4 | Humanities/Social Sciences |

### 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.

Total Units to Graduate: 180
Maximum Units: 220
### 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.

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