

Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

|  | Course Number & Title (units)   | Prerequisites†   |
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| <b>Complete ALL of the following lower division courses:</b> |   |  |
|  | ECS 20: Discrete Mathematics for Computer Science (4)   | a 'C-' or higher in MAT 16A or 17A or 19A or 21A   |
|  | <b>ONE (1)</b> of the following series options in its entirety: <i>mixing of courses between series is not allowed</i>  |  |
|  | <ul style="list-style-type: none"> <li>□ ECS 36 Series: - <i>intended for declared CS/CSE majors</i></li> <li style="padding-left: 20px;">ECS 36A: Programming &amp; Problem Solving (4)</li> <li style="padding-left: 20px;">ECS 36B: Software Development &amp; Object-Oriented Programming in C++ (4)</li> <li style="padding-left: 20px;">ECS 36C: Data Structures, Algorithms, &amp; Programming (4)</li> </ul>  | <p><b>ECS 36A:</b> a 'C-' or higher in ECS 32A, or must satisfy computer science placement exam</p> <p><b>ECS 36B:</b> a 'C-' or higher in ECS 36A</p> <p><b>ECS 36C:</b> a 'C-' or higher in ECS 20 and in ECS 36B</p>  |
|  | <b>OR</b>   |  |
|  | <ul style="list-style-type: none"> <li>□ ECS 32/34 Series: - <i>intended for non-majors who want to change to CS or CSE</i></li> <li style="padding-left: 20px;">ECS 32A: Introduction to Programming or ECS 36A: Programming &amp; Problem Solving (4)</li> <li style="padding-left: 20px;">ECS 32B: Introduction to Data Structures (4)</li> <li style="padding-left: 20px;">ECS 32C: Implementation of Data Structures in C (4)</li> <li style="padding-left: 20px;">ECS 34: Software Development in UNIX &amp; C++ (4)</li> </ul> | <p><b>ECS 32A:</b> none</p> <p><b>ECS 32B:</b> a 'C-' or higher in ECS 32A or 36A</p> <p><b>ECS 32C:</b> a 'C-' or higher in ECS 32B</p> <p><b>ECS 34:</b> a 'C-' or higher in ECS 32C</p>   |
|  | ECS 50: Computer Organization & Machine Dependent Programming (4)   | a 'C-' or higher in ECS 34 or 36B  |
|  | MAT 21A: Calculus (4)   | must satisfy mathematics placement requirement   |
|  | MAT 21B: Calculus (4)   | a 'B' or higher in MAT 17A, or a 'C-' or higher in either MAT 21A or 21AH  |
|  | MAT 21C: Calculus (4)   | a 'B' or higher in MAT 17B, or a 'C-' or higher in MAT 16C or 17C or 21B or 21BH   |
|  | MAT 21D: Vector Analysis (4)  | a 'B' or higher in MAT 17C, or a 'C-' or higher in MAT 21C or 21CH   |
|  | <b>ONE (1)</b> of the following:  |  |
|  | <ul style="list-style-type: none"> <li>□ MAT 22A: Linear Algebra (3)</li> <li>□ MAT 27A: Linear Algebra with Applications to Biology (4)</li> <li>□ MAT 67: Modern Linear Algebra (4)</li> </ul>  | <p><b>MAT 22A:</b> a 'C-' or higher in MAT 16C or 17C or 21C or 21CH; ENG 6 or EME 5 or ECH 60 or MAT 22AL may be taken concurrently</p> <p><b>MAT 27A:</b> a 'C-' or higher in MAT 17C or 21C or 21CH</p> <p><b>MAT 67:</b> a 'C-' or higher in MAT 21C or 21CH</p>                                   |
|  | <b>ONE (1)</b> of the following:  |  |
|  | <ul style="list-style-type: none"> <li>□ MAT 22B: Differential Equations (3)</li> <li>□ MAT 27B: Differential Equations with Applications to Biology (4)</li> </ul>   | <p><b>MAT 22B:</b> a 'C-' or higher in MAT 22A or 67</p> <p><b>MAT 27B:</b> a 'C-' or higher in MAT 27A or BIS 27A, or a 'C-' or higher in MAT 22A and in either MAT 22AL or ENG 6 or ECS 32A or ECS 36A or ECH 60 or EME 5</p>  |
|  | <b>ONE (1)</b> of the following:  |  |
|  | <ul style="list-style-type: none"> <li>□ CHE 2A General Chemistry (5)</li> <li>□ CHE 4A: General Chemistry for the Physical Sciences &amp; Engineering (5)</li> </ul>   | <p><b>CHE 2A:</b> a score of 24 or higher on the chemistry placement exam or a 'C-' or better in CHE 1V</p> <p><b>CHE 4A:</b> a score of 28 or higher on the chemistry placement exam</p>  |
|  | PHY 9A: Classical Physics (5)   | MAT 21B or 21M   |
|  | PHY 9B: Classical Physics (5)   | PHY 9A; MAT 21C; MAT 21D (may be taken concurrently)   |
|  | PHY 9C: Classical Physics (5)   | PHY 9B; MAT 21D; MAT 22A or 27A (may be taken concurrently)  |
|  | PHY 9D: Modern Physics (4)  | PHY 9C; MAT 22A or 27A   |
|  | ENG 17: Circuits I (4)  | MAT 21C  |
|  | CMN 1: Introduction to Public Speaking (4)  | none   |
|  | <b>ONE (1)</b> of the following:  |  |
|  | <ul style="list-style-type: none"> <li>□ COM 1: Major Works of the Ancient World (4)</li> <li>□ COM 2: Major Works of the Medieval &amp; Early Modern World (4)</li> <li>□ COM 3: Major Works of the Modern World (4)</li> <li>□ COM 4: Major Works of the Contemporary World (4)</li> <li>□ ENL 3: Introduction to Literature (4)</li> <li>□ NAS 5: Introduction to Native American Literature (4)</li> <li>□ UWP 1 or UWP 1V or UWP 1Y: Introduction to Academic Literacies (4)</li> </ul>  | <p><b>COM 1:</b> completion of ELWR</p> <p><b>COM 2:</b> completion of ELWR</p> <p><b>COM 3:</b> completion of ELWR</p> <p><b>COM 4:</b> completion of ELWR</p> <p><b>ENL 3:</b> completion of ELWR</p> <p><b>NAS 5:</b> completion of Subject Requirement</p> <p><b>UWP 1:</b> completion of ELWR</p> |

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| <b>Complete ALL of the following depth subject matter courses:</b> |   |  |
|  | UWP 101/101V/101Y: Advanced Composition (4) <b>OR</b> Upper Division Composition Exam   | a 'C-' or higher in UWP 1 or 1V or 1Y or COM 1 or 2 or 3 or 4 or ENL 3 or NAS 5; upper division standing                         |
|  | <b>ONE (1)</b> of the following:  |  |
|  | <ul style="list-style-type: none"> <li>□ ECS 120: Theory of Computation (4)*</li> <li>□ ECS 122A: Algorithm Design &amp; Analysis (4)*</li> </ul> | <p><b>ECS 120:</b> ECS 20 or MAT 108</p> <p><b>ECS 122A:</b> ECS 20; ECS 32B or 36C or 60</p>                                    |
|  | ECS 132: Probability & Statistical Modeling for Computer Science (4)  | ECS 34 or 36B; ECS 20; MAT 21C; MAT 22A or 27A or 67   |
|  | ECS 140A: Programming Languages (4)   | ECS 20; ECS 50; ECS 34 or 36C; ECS 150 recommended   |
|  | ECS 150: Operating Systems & System Programming (4)   | ECS 34 or 36C; ECS 154A or EEC 170   |
|  | ECS 152A: Computer Networks (4)   | ECS 32B or 36C; ECS 132 or EEC 161 or MAT 135A or STA 32 or 35B or 100 or 131A   |
|  | ECS 154A: Computer Architecture (4)   | ECS 50 or EEC 70   |
|  | ECS 154B: Computer Architecture (4)   | ECS 154A or EEC 170 or EEC 180A  |
|  | ECS 160: Software Engineering (4)   | ECS 140A   |
|  | ECS 188: Ethics in an Age of Technology (4)   | upper division standing  |
|  | ECS 193A <b>AND</b> ECS 193B: Capstone Project (6)  | <b>ECS 193A:</b> ECS 160 (may be taken concurrently); ECS 150; upper division standing;<br><b>ECS 193B:</b> ECS 193AIP or better |
|  | EEC 100: Circuits II (5)  | a 'C-' or higher in ENG 17; MAT 22B or 27B   |
|  | EEC 172: Embedded Systems (4)   | EEC 100; EEC 170 or ECS 154A   |

| Course Number & Title (units)   | Prerequisites†   |
|---|--|
| <b>Complete a minimum of 4 courses and 15 units from the following Upper Division Electives:<br/>a maximum of 1 course from the restrictive elective list** may be used as an upper division elective</b> |  |
| ☐ ECS 120: Theory of Computation (4) *  | ECS 20 or MAT 108  |
| ☐ ECS 122A: Algorithm Design & Analysis (4) *   | ECS 20; ECS 32B or 36C   |
| ☐ ECS 122B: Algorithm Design & Analysis (4)   | ECS 122A; ECS 34 or 36C  |
| ☐ ECS 124: Theory & Practice of Bioinformatics (4)  | ECS 32A or 36A or ENG 6; STA 32 or 35B or 100 or 131A or MAT 135A or BIM 105 or ECS 132 or EEC 161; BIS 2A or MCB 10 |
| ☐ ECS 127: Cryptography (4)   | ECS 20 or MAT 108; ECS 32A or 36A  |
| ☐ ECS 129: Computational Structural Bioinformatics (4)  | BIS 2A or MCB 10; ECS 32A or 36A   |
| ☐ ECS 130: Scientific Computation (4)   | ECS 32A or 36A or ENG 6; MAT 22A or 27A or 67  |
| ☐ ECS 153: Computer Security (4)  | ECS 150; ECS 152A or EEC 173A  |
| ☐ ECS 158: Programming on Parallel Architectures (4)  | ECS 150  |
| ☐ ECS 161: Modern Programming Tools (4)   | ECS 32B or 36B   |
| ☐ ECS 162: Web Programming (4)  | ECS 34 or 36B  |
| ☐ ECS 163: Information Interfaces (4)   | ECS 32B or 36C   |
| ☐ ECS 164: Human-Computer Interaction (4)   | none   |
| ☐ ECS 165A: Database Systems (4)  | ECS 32B or 36C   |
| ☐ ECS 170: Introduction to Artificial Intelligence (4)  | ECS 32B or 36C   |
| ☐ ECS 171: Machine Learning (4)   | ECS 32B or 36C; STA 32 or STA 35B or STA 131A or ECS 132 or MAT 135A or EEC 161; MAT 22A or 27A or 67                |
| ☐ ECS 172: Recommender Systems (4)  | ECS 32B or 36B; ECS 132 or STA 130A or STA 131A or ECN 140; MAT 22A or 27A or 67                                     |
| ☐ ECS 173: Image Processing & Analysis (4)  | a 'C-' or higher in MAT 22A or 27A or 67; ECS 32B or 36C   |
| ☐ ECS 174: Computer Vision (4)  | ECS 32B or 36C; MAT 22A or 27A or 67   |
| ☐ ECS 175: Computer Graphics (4)  | ECS 34 or 36C; MAT 22A or 27A or 67  |
| ☐ ECS 177: Scientific Visualization (4)   | ECS 175  |
| ☐ ECS 178: Geometric Modeling (4)   | ECS 175  |
| ☐ ECS 179: Gameplay Programming (4)   | ECS 32B or ECS 36C   |
| ☐ ECS 189: Special Topics (4)   | instructor consent   |
| ☐ ECS 191: Software Design Project (4)  | ECS 160  |
| ☐ ECS 192: Internship OR ECS 197T: Tutoring OR ECS 199: Special Study OR ECS 199FB: Teaching (3-5)  | varies; see department website   |
| ☐ Any other ECS course 120-189 not already used in the major (4)  | varies; see department website   |
| ☐ EEC 171: Parallel Computer Architecture (4)   | EEC 170 or ECS 154B  |
| ☐ EEC 180: Digital Systems II (5)   | EEC 18 or 180A   |

**Restrictive Elective List: \*\***

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| ☐ ECN 122: Theory of Games & Strategic Behavior (4)                          | MAT 16A & 16B, or MATH 21A & 21B, or MAT 17A & 17B, or instructor consent    |
| ☐ LIN 127: Text Processing & Corpus Linguistics (4)                          | none   |
| ☐ LIN 177: Computational Linguistics (4)                                     | instructor consent   |
| ☐ PSC 120: Agent-Based Modeling (4)  | none   |
| ☐ MAT 135A: Probability (4)  | MAT 21C; MAT 67 or 108   |
| ☐ MAT 135B: Stochastic Processes (4)   | MAT 135A; MAT 22A or MAT 27A or MAT 67 or BIS 27A                            |
| ☐ STS 115: Data Sense & Exploration: Critical Storytelling with Analysis (4) | none   |
| ☐ STA 131A: Introduction to Probability Theory (4)                           | a 'C-' or higher in MAT 21C and in either MAT 22A or 27A or 67               |
| ☐ STA 131B: Introduction to Mathematical Statistics (4)                      | a 'C-' or higher in STA 131A or MAT 135A; instructor consent                 |
| ☐ STA 142A: Statistical Learning I (4)                                       | a 'C-' or higher in STA 141A, and in either STA 130A or STA 131A or MAT 135A |
| ☐ STA 142B: Statistical Learning II (4)                                      | a 'C-' or higher in STA 142A, and in either STA 130B or 131B                 |

†Prerequisites are subject to change; consult the University Catalog (<https://catalog.ucdavis.edu/>) for the most recent updates

\*Completion of a core requirement will not satisfy an elective requirement simultaneously

✓Total units required for CSE major: 144-154