

BS in Computer Science (CS)
Major Checklist
2023-2024 Catalog

Name: _____

Student ID: _____

	Course Number & Title (units)	Prerequisites†
Complete ALL of the following preparatory subject matter courses:		
	ECS 20: Discrete Mathematics for Computer Science (4)	a 'C-' or better in MAT 16A or 17A or 19A or 21A
	ONE (1) of the following series options in its entirety: <i>mixing of courses between series is not allowed</i> □ ECS 36 Series: - <i>intended for declared CS/CSE majors</i> - ECS 36A: Programming & Problem Solving (4) - ECS 36B: Software Development & Object-Oriented Programming in C++ (4) - ECS 36C: Data Structures, Algorithms, & Programming (4) OR □ ECS 32/34 Series: - <i>intended for non-majors who want to change to CS or CSE</i> - ECS 32A: Introduction to Programming or ECS 36A: Programming & Problem Solving (4) - ECS 32B: Introduction to Data Structures (4) - ECS 32C: Implementation of Data Structures in C (4) - ECS 34: Software Development in UNIX & C++ (4)	ECS 36A: a 'C-' or better in ECS 32A, or must satisfy computer science placement exam ECS 36B: a 'C-' or better in ECS 36A ECS 36C: a 'C-' or better in ECS 20 and in ECS 36B ECS 32A: none ECS 32B: a 'C-' or better in ECS 32A or 36A ECS 32C: a 'C-' or better in ECS 32B ECS 34: a 'C-' or better in ECS 32C
	ECS 50: Computer Organization & Machine Dependent Programming (4)	a 'C-' or better in ECS 34 or 36B
	MAT 21A: Calculus (4)	must satisfy mathematics placement requirement
	MAT 21B: Calculus (4)	a 'B' or better in MAT 17A, or a 'C-' or better in either MAT 21A or 21AH
	MAT 21C: Calculus (4)	a 'B' or better in MAT 17B, or a 'C-' or better in MAT 16C or 17C or 21B or 21BH
	ONE (1) of the following: □ MAT 22A: Linear Algebra (3) □ MAT 27A: Linear Algebra with Applications to Biology (4) □ MAT 67: Modern Linear Algebra (4)	MAT 22A: a 'C-' or better in MAT 16C or 17C or 21C or 21CH; ENG 6 or EME 5 or ECH 60 or MAT 22AL may be taken concurrently MAT 27A: a 'C-' or better in MAT 17C or 21C or 21CH MAT 67: a 'C-' or better in MAT 21C or 21CH
Complete THREE of the following courses: <i>Courses can be from any combination of subjects</i>		
	□ BIS 2A: Introduction to Biology - Essentials of Life on Earth (5)	none
	□ BIS 2B: Introduction to Biology - Principles of Ecology & Evolution (5)	none
	□ BIS 2C: Introduction to Biology - Biodiversity & the Tree of Life (5)	a 'C-' or better in BIS 1B or 2B
	□ CHE 2A: General Chemistry (5)	a score of 24 or higher on the chemistry placement exam or a 'C-' or better in CHE 1V
	□ CHE 2B: General Chemistry (5)	a 'C-' or better in CHE 2A
	□ CHE 2C: General Chemistry (5)	a 'C-' or better in CHE 2B or 2BH
	□ CHE 4A: General Chemistry for the Physical Sciences & Engineering (5)	a score of 28 or better on the chemistry placement exam
	□ CHE 4B: General Chemistry for the Physical Sciences & Engineering (5)	a 'C-' or better in CHE 4 or CHE 2AH; MAT 21B (may be taken concurrently)
	□ CHE 4C: General Chemistry for the Physical Sciences & Engineering (5)	a 'C-' or better in CHE 4B or CHE 2B or CHE 2BH; MAT 21C (may be taken concurrently)
	□ 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)
Complete ALL of the following depth subject matter courses:		
	ECS 122A: Algorithm Design & Analysis (4)	ECS 20; ECS 32B or 36C
	ONE (1) of the following: □ ECS 120: Theory of Computation (4)* □ ECS 122B: Algorithm Design & Analysis (4)*	ECS 120: ECS 20 or MAT 108 ECS 122B: ECS 122A; ECS 34 or 36C
	ECS 140A: Programming Languages (4)	ECS 20; ECS 50; ECS 32B or 36C recommended: ECS 150
	ECS 150: Operating Systems & System Programming (4)	ECS 34 or 36C; ECS 154A or EEC 170; not open to CS majors in pass one
	ECS 154A: Computer Architecture (4)	ECS 50 or EEC 70
	ONE (1) of the following: □ ECS 132: Probability & Statistical Modeling for Computer Science (4)* □ MAT 135A: Probability (4)* □ STA 131A: Introduction to Probability Theory (4)*	ECS 132: ECS 20; MAT 21C; ECS 34 or 36B; MAT 22A or 27A or 67 MAT 135A: MAT 21C; MAT 67 or 108 STA 131A: a 'C-' or better in MAT 21C and in either MAT 22A or 27A or 67

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Complete 7 courses from the following Computer Science Electives: <i>a minimum of 4 course must be ECS courses; at least 1 course must be a MAT or STA course</i>		
☐	ECS 120: Theory of Computation (4) *	ECS 20 or MAT 108
☐	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 ECS 36A or ENG 6; MAT 22A or 27A or 67
☐	ECS 132: Probability & Statistical Modeling for Computer Science (4) *	ECS 34 or 36B; ECS 20; MAT 21C; MAT 22A or 27A or 67
☐	ECS 152A: Computer Networks (4)	ECS 32B or 36C; ECS 132 or EEC 161 or MAT 135A or STA 32 or STA 35B or STA 100 or STA 131A
☐	ECS 153: Computer Security (4)	ECS 150; ECS 152A or EEC 173A
☐	ECS 154B: Computer Architecture (4)	ECS 154A or EEC 170 or EEC 180A
☐	ECS 158: Programming on Parallel Architectures (4)	ECS 150
☐	ECS 160: Software Engineering (4)	ECS 140A
☐	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 032 or 35B or 131A or ECS 132 or MAT 135A or EEC 161; MAT 022A or MAT 027A or MAT 67
☐	ECS 172: Recommender Systems (4)	ECS 32B or 36B; ECS 132 or STA 130A or 131A or ECN 140; MAT 22A or 27A or 67
☐	ECS 173: Image Processing & Analysis (4)	a 'C-' or better in MAT 22A or 27A or 67; ECS 32B or 36C
☐	ECS 174: Computer Vision (4)	ECS 32B or 36C
☐	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 188: Ethics in an Age of Technology (4)	upper division standing; not open to CS majors in pass one
☐	ECS 189: Special Topics (4)	instructor consent
☐	ECS 191: Software Design Project (4)	ECS 160
☐	ECS 192: Internship in Computer Science (3-5) OR ECS 199: Special Study (3-5)	varies; see department website
☐	ECS 193A AND ECS 193B: Senior Design Project (6) - <i>counts as one course</i>	ECS 193A: ECS 160 (may be taken concurrently); senior standing; not open to CS majors in pass one; ECS 193B: ECS 193AIP or better; not open to CS majors in pass one
☐	Any other ECS course 120-189 not already used in the major (4)	varies; see department website
☐	EEC 100: Circuits II (5)	a 'C-' or better in ENG 17; MAT 22B or 27B
☐	EEC 171: Parallel Computer Architecture (4)	EEC 170 or ECS 154B
☐	EEC 172: Embedded Systems (4)	EEC 100; EEC 170 or ECS 154A
☐	EEC 180: Digital Systems II (5)	EEC 18 or 180A
☐	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
☐	STS 115: Data Sense & Exploration: Critical Storytelling with Analysis (4)	none
☐	STA 131A: Introduction to Probability Theory (4) *	a 'C-' or better in MAT 21C and in either MAT 22A or 27A or 67
☐	STA 131B: Introduction to Mathematical Statistics (4)	a 'C-' or better in STA 131A or MAT 135A; instructor consent
☐	STA 141B: Data & Web Technologies for Data Analysis (4)	a 'C-' or better in STA 141A
☐	STA 141C: Big Data & High Performance Statistical Computing (4)	a 'C-' or better in STA 141B, or a 'C-' or better in STA 141A and ECS 32A
☐	STA 142A: Statistical Learning I (4)	a 'C-' or better in STA 141A, and in either STA 130A or STA 131A or MAT 135A
☐	STA 142B: Statistical Learning II (4)	a 'C-' or better in STA 142A, and in either STA 130B or 131B
☐	Any MAT course numbered between 100-189, excluding MAT 111* (3-4)	varies; see university catalog

†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 CS major: 100-106