

# Articulation Agreement by Major

Effective during the 2022-2023 Academic Year

To: University of California, Santa Cruz  
2022-2023 General Catalog, Quarter

From: De Anza College  
2022-2023 General Catalog, Quarter

## Computer Engineering Minor

### GENERAL INFORMATION FOR ALL MINORS

UC Santa Cruz students have the option to complete one or more minors, provided they complete all of the required coursework for the minor(s). The sponsoring department establishes the course requirements for a minor. The minor involves substantial work in the discipline and requires no fewer than 25 upper-division or graduate credits. The minor appears on the student's official transcript but not on the diploma.

Students do not apply for admission into a minor when applying to UC Santa Cruz. If interested in completing a minor, transfer students must contact the department sponsoring the minor after enrolling at UCSC.

### COMPUTER ENGINEERING MINOR

Please visit the department's website to learn more about this minor: <https://undergrad.soe.ucsc.edu/>

#### PREPARATION FOR THE MINOR

CSE 12: Computer Systems and Assembly Language and Lab

CSE 13S: Computer Systems and C Programming **OR** ECE 13: Computer Systems and C Programming

CSE 16: Applied Discrete Mathematics

CSE 20: Beginning Programming in Python

CSE 30: Programming Abstractions: Python

MATH 19A: Calculus for Science, Engineering, and Mathematics

MATH 19B: Calculus for Science, Engineering, and Mathematics

AM 20: Mathematical Methods for Engineers II **OR** MATH 24: Ordinary Differential Equations

PHYS 5A: Introduction to Physics I **AND** PHYS 5L: Introduction to Physics I Laboratory **OR**

PHYS 6A: Introductory Physics I **AND** PHYS 6L: Introductory Physics I Laboratory

PHYS 5C: Introduction to Physics III **AND** PHYS 5N: Introduction to Physics III Laboratory **OR**

PHYS 6C: Introductory Physics III **AND** PHYS 6N: Introductory Physics III Laboratory

### PREPARATION FOR THE MINOR

**CSE 12** - Computer Systems and Assembly Language and Lab (7.00)



**CIS 21JA** - Introduction to x86 Processor Assembly Language and Computer Architecture (4.50)

--- Or ---

**CIS 21JB** - Advanced x86 Processor Assembly Programming (4.50)

**CSE 13S** - Computer Systems and C Programming (7.00)



**CIS 22B** - Intermediate Programming Methodologies in C++ (4.50)

--- Or ---

**CIS 22BH** - Intermediate Programming Methodologies in C++ - HONORS (4.50)

--- Or ---

**CIS 26A** - C as a Second Programming Language (4.50)

--- Or ---

**ECE 13** - Computer Systems and C Programming (7.00)



No Course Articulated

**CSE 16** - APPLIED DISCRETE MATHEMATICS (5.00)



**MATH 22** - Discrete Mathematics (5.00)

--- Or ---

**MATH 22H** - Discrete Mathematics - HONORS (5.00)

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|---|---|---|
| <b>CSE 20</b> - Beginning Programming in Python (5.00)                      | ← | <b>CIS 40</b> - Introduction to Programming in Python (4.50)<br>--- Or ---<br><b>CIS 41A</b> - Python Programming (4.50)  |
| <b>CSE 30</b> - Programming Abstractions: Python (7.00)                     | ← | <b>CIS 22C</b> - Data Abstraction and Structures (4.50)<br>• <i>Minimum grade required: B or better</i><br>--- Or ---<br><b>CIS 22CH</b> - Data Abstraction and Structures - HONORS (4.50)<br>• <i>Minimum grade required: B or better</i>        |
| <b>MATH 19A</b> - Calculus for Science, Engineering, and Mathematics (5.00) | ← | <b>MATH 1A</b> - Calculus (5.00)<br>--- Or ---<br><b>MATH 1AH</b> - Calculus - HONORS (5.00)  |
| <b>MATH 19B</b> - Calculus for Science, Engineering, and Mathematics (5.00) | ← | <div> <b>MATH 1B</b> - Calculus (5.00)<br/>--- And ---<br/><b>MATH 1C</b> - Calculus (5.00) </div> <div> --- Or --- </div> <div> <b>MATH 1BH</b> - Calculus - HONORS (5.00)<br/>--- And ---<br/><b>MATH 1CH</b> - Calculus - HONORS (5.00) </div> |

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| <b>AM 20</b> - Mathematical Methods for Engineers II (5.00) | ← | <b>MATH 2A</b> - Differential Equations (5.00)<br>--- Or ---<br><b>MATH 2AH</b> - Differential Equations - HONORS (5.00) |
| <b>MATH 24</b> - Ordinary Differential Equations (5.00)     | ← | <b>MATH 2A</b> - Differential Equations (5.00)<br>--- Or ---<br><b>MATH 2AH</b> - Differential Equations - HONORS (5.00) |

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| <b>PHYS 5A</b> - Introduction to Physics I (5.00)            | ← | <b>PHYS 4A</b> - Physics for Scientists and Engineers: Mechanics (6.00) |
| <b>PHYS 5L</b> - INTRODUCTION TO PHYSICS I LABORATORY (1.00) | ← | <b>PHYS 4A</b> - Physics for Scientists and Engineers: Mechanics (6.00) |

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|---|---|---|
| <b>PHYS 6A</b> - Introductory Physics I (5.00)            | ← | <b>PHYS 4A</b> - Physics for Scientists and Engineers: Mechanics (6.00)<br>--- Or ---<br><b>PHYS 2A</b> - General Introductory Physics (5.00) |
| <b>PHYS 6L</b> - Introductory Physics I Laboratory (1.00) | ← | <b>PHYS 4A</b> - Physics for Scientists and Engineers: Mechanics (6.00)<br>--- Or ---<br><b>PHYS 2A</b> - General Introductory Physics (5.00) |

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| <b>PHYS 5C</b> - Introduction to Physics III (5.00)            | ← | <b>PHYS 4B</b> - Physics for Scientists and Engineers: Electricity and Magnetism (6.00) |
| <b>PHYS 5N</b> - INTRODUCTION TO PHYSICS III LABORATORY (1.00) | ← | <b>PHYS 4B</b> - Physics for Scientists and Engineers: Electricity and Magnetism (6.00) |

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| <b>PHYS 6C</b> - Introductory Physics III (5.00)            | ← | <b>PHYS 4B</b> - Physics for Scientists and Engineers: Electricity and Magnetism (6.00)<br>--- Or ---<br><b>PHYS 2B</b> - General Introductory Physics (5.00) |
| <b>PHYS 6N</b> - INTRODUCTORY PHYSICS III LABORATORY (1.00) | ← | <b>PHYS 4B</b> - Physics for Scientists and Engineers: Electricity and Magnetism (6.00)<br>--- Or ---<br><b>PHYS 2B</b> - General Introductory Physics (5.00) |

**END OF AGREEMENT**