# Computer Science Major Elective Approval Form

2018-2019 GEAR Year: 28 elective units       2020-2021 GEAR Year: 32 elective units

2019-2020 GEAR Year: 28 elective units       2021-2022 GEAR Year: 32 elective units

| Student's Name | Student's @ucsb email | Student's Perm # |
|---|---|---|

*As of Winter 2022, students do not need to complete or submit this form if they participate in and attend a department faculty advising event. This form should only be used for graduating seniors that were unable to attend a department advising event in the quarter they declared candidacy.*

| Course Department & Number | Course Name | # of Units |
|---|---|---|
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| | After meeting with a CS faculty member, I have received advising regarding any range of topics such as research, internships, graduate school, and/or major elective course options and thus have met the "prior approval must be obtained from the student's faculty advisor" advising requirement. | |
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| Student's Signature | Date |
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FOR ANY CS DEPARTMENT FACULTY MEMBER

I have advised this student regarding any range of topics such as: research, internships, graduate school, major elective course options, etc.

| Faculty's Name | Faculty's Signature | Date |
|---|---|---|

# Upper Division Elective List

### Programming

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|---|---|
| CMPSC 156* | Advanced Applications Programming |

*One course of 148/156/172 required for students who started in 2020-21, the others can apply towards Major Electives. Students **prior** to 2020-21 GEAR years are required to do <u>both</u> 148 and 156 (formerly 48 and 56). Refer student to dept undergrad staff advisor if interested in changing to 2020-21 GEAR Catalog year.

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|---|---|
| CMPSC 160/162* | Translation of Programming Language/Programming Languages |

*One course required for students who started in 2017-2018, the other can apply towards Major Electives. Students **prior** to 2017-2018 curric years are required to do <u>both</u> 160 and 162.

### Communication Networks

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| CMPSC 176A | Introduction to Computer Communication Networks |
| CMPSC 176B | Network Computing |
| CMPSC 176C | Advanced Topics in Internet Computing |

### Software Systems

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| CMPSC 171/ECE 151 | Distributed Systems |
| CMPSC 174A | Fundamentals of Database Systems |
| CMPSC 174B | Design and Implementation Techniques of Database Systems |
| CMPSC 180 | Computer Graphics |

### Computer Security

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| CMPSC 177 | Computer Security |
| CMPSC 178 | Introduction to Cryptography |

### Artificial Intelligence

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| CMPSC 165A | Artificial Intelligence |
| CMPSC 165B | Machine Learning |
| CMPSC/ECE 181 | Introduction to Computer Vision |

### Vision and Graphics

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| ECE 178 | Introduction to Digital Image and Video Processing |
| CMPSC 180 | Computer Graphics |
| CMPSC/ECE 181 | Introduction to Computer Vision |
| CMPSC 182/ECE 160 | Multimedia Computing |

### Interactivity

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|---|---|
| CMPSC 180 | Computer Graphics |
| CMPSC/ECE 181 | Introduction to Computer Vision |
| CMPSC 182/ECE 160 | Multimedia Computing |
| CMPSC 184 | Mobile Application Development (Android) |
| CMPSC 185 | Human-Computer Interaction |

### Undergraduate Projects, Special Topics, and Research

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| CMPSC 148* | Computer Science Project<br>*One course of 148/156/172 required for students who started in 2020-21, the others can apply towards Major Electives. Students **prior** to 2020-21 GEAR years are required to do <u>both</u> 148 and 156 (formerly 48 and 56). |
| CMPSC 189A/B | Senior Computer Systems Project (CAPSTONE) |
| CMPSC 190AA-ZZ | Special Topics in Computer Science |
| CMPSC 192 | Projects in Computer Science (Only available to students with GPA = 3.0, **Four units maximum** w/a **Letter Grade** from CMPSC 192 and CMPSC 196 *combined* may be counted as upper division electives) |
| CMPSC 196 | Undergraduate Research (Only available to students with GPA = 3.0, **Four units maximum** w/a **Letter Grade** from CMPSC 192 and CMPSC 196 *combined* may be counted as upper division electives) |

### Hardware

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| ECE 152A | Digital Design Principles |
| CMPSC/ECE 153A | Hardware/Software Interface |
| ECE 153B | Sensor and Peripheral Interface Design |

### Signal Processing

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| ECE 130A/B/C | Signal Analysis and Processing |

### Scientific Computing and Mathematics

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|---|---|
| CMPSC 111/140* | Introduction to Computational Science/Parallel Scientific Computing<br>*One course required for the major, the other can apply towards Major Electives |
| MATH 108A/B | Introduction to Linear Algebra |
| MATH 119A/B | Ordinary Differential Equations/Chaotic Dynamics and Bifurcation Theory |
| MATH 124A/B | Partial Differential Equations/Fourier Series and Numerical Methods |

### PSTAT

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|---|---|
| PSTAT 122/130 | Design and Analysis of Experiments/SAS Base Programming |
| PSTAT 160A/B | Applied Stochastic Processes |