# COMPUTATIONAL BIOLOGY, MINOR

**College of Engineering**

The minor in Computational Biology will provide to students with engineering, physical science or biological science majors the foundations necessary to build efficient computational models and algorithms, use state-of-the-art techniques for scientific analysis and create scalable infrastructure environments for biological and biotechnological applications.

More information can be found on the CS Advising website (https://cs.ucdavis.edu/minors/).

## Minor Advisors

Faculty Advisors: V. Filkov, D. Gusfield, P. Koehl, I. Tagkopoulos
Academic J. Clifford, K. Gage, P. Kumari

Students must take a total of 19-24 upper division units, with two required courses and 11-12 units of upper division electives, as specified below. A minimum GPA of 2.000 is required for coursework in the minor. Students should note that most of the courses listed below have lower division prerequisites. In particular, required course ECS 122A has a prerequisite chain of ECS 020, ECS 036A, ECS 036B, and ECS 036C. No more than one course of upper division work will be permitted for overlap between any major and the minor.

| Code | Title | Units |
|---|---|---|
| **Required Courses** | | |
| ECS 122A | Algorithm Design & Analysis | 4 |
| ECS 124 | Theory & Practice of Bioinformatics | 4 |
| **Electives** | | |
| Choose 12-15 units: | | 12-15 |
| Choose at least one biology course; 4 units minimum: | | |
| BIS 101 | Genes & Gene Expression | |
| or BIS 101V | Genes & Gene Expression | |
| BIS 104 | Cell Biology | |
| BIS 122 | Population Biology & Ecology | |
| EVE 100 | Introduction to Evolution | |
| EVE 101 | Introduction to Ecology | |
| EVE 102 | Population & Quantitative Genetics | |
| EVE 103 | Phylogeny, Speciation & Macroevolution | |
| EVE 131 | Human Genetic Variation & Evolution | |
| MCB 121 | Advanced Molecular Biology | |
| MCB 124 | Macromolecular Structure & Function | |
| MCB 182 | Principles of Genomics | |
| Choose at least one computational or statistics course: | | |
| BIS 132 | (Discontinued) | |
| BIT 150 | Applied Bioinformatics | |
| ECS 130 | Scientific Computation | |
| ECS 132 | Probability & Statistical Modeling for Computer Science | |
| ECS 140A | Programming Languages | |
| ECS 145 | Scripting Languages & Their Applications | |
| ECS 158 | Programming on Parallel Architectures | |
| ECS 160 | Software Engineering | |
| ECS 165A | Database Systems | |
| ECS 170 | Introduction to Artificial Intelligence | |
| ECS 171 | Machine Learning | |
| ECS 177 | Scientific Visualization | |
| STA 130A | Mathematical Statistics: Brief Course | |
| STA 141A | Fundamentals of Statistical Data Science | |
| STA 141B | Data & Web Technologies for Data Analysis | |
| STA 141C | Big Data & High Performance Statistical Computing | |
| Choose at least one computational biology and bioinformatics course: | | |
| BIS 132 | (Discontinued) | |
| BIT 150 | Applied Bioinformatics | |
| BIM 117 | Modeling Strategies for Biomedical Engineering | |
| ECS 129 | Computational Structural Bioinformatics | |
| **Total Units** | | **20-23** |