

# Scientific Computing, Minor

## Minor in Scientific Computing

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### Overview

Sometimes called “computational science,” scientific computing is the application of high-performance computers and modern computational technologies to problems in the sciences and engineering. Research in this area is inherently multidisciplinary, requiring strong ties with a scientific discipline.

MCS students can easily build on their scientific training with this applied computational program. The curriculum consists of five areas of concentration, which span the natural sciences, mathematics, programming, and research. The curriculum is structured to allow flexibility in choosing courses that meet students’ particular interests or best compliment their major. The minor is also a natural choice for students majoring in any technical area.

### Required Courses

Students must meet the requirements of the following categories:

#### A. Non-Introductory Science Requirement (9-12 units)

Complete one (1) course from Biological Sciences, Chemistry, or Physics at the 200 level or higher, excluding those courses listed below as part of the requirements of the minor. Courses with a significant science component from other colleges may be substituted with approval from the minor advisor.

#### B. Computational Science Requirement (18-24 units)

Complete two (2) of the following courses:

|        |                                              | Units |
|--------|----------------------------------------------|-------|
| 03-250 | Introduction to Computational Biology        | 12    |
| 03-511 | Computational Molecular Biology and Genomics | 9     |
| 15-386 | Neural Computation                           | 9     |
| 33-241 | Introduction to Computational Physics        | 9     |

#### C. Computational Methods Requirement (9 units)

Complete one (1) of the following courses from outside of your home department.

|        |                                                    |    |
|--------|----------------------------------------------------|----|
| 21-369 | Numerical Methods                                  | 12 |
| 33-658 | Quantum Computation and Quantum Information Theory | 10 |
| 33-232 | Mathematical Methods of Physics                    | 10 |
| 33-456 | Advanced Computational Physics                     | 9  |
| 36-410 | Introduction to Probability Modeling               | 9  |

#### D. Applied Scientific Computing Research Project(s) (9 units)

Complete one (1) approved research project in an area of applied scientific computing. In some cases, this research could be replaced with 9 units of an approved project-based course in advanced scientific computing. The administrator of the minor will maintain a list of appropriate courses. Under special circumstances summer research may count toward this requirement, although it cannot be counted toward the units required for graduation.

#### E. Complete any (1) additional course from category C or D (9 units)