

Curriculum for Computational Science and Engineering Minor

The computational science and engineering (CSE) minor is an interdisciplinary program that prepares students for graduate study and research careers in modeling and simulation of physical and engineering applications using modern supercomputers. This minor is based on a foundation of computer science and mathematics applied to computational aspects of scientific discovery and problem solving within science and engineering disciplines. Furthermore it emphasizes the integration of knowledge and methodologies from all of these disciplines.

Students seeking a CSE minor must be pursuing one of the following major fields: any of the engineering departments, geophysics, geosciences, applied mathematics, mathematics, physics, chemistry and computer science. **A GPA average of 3.0, calculated using course grades from Math 170, Phys 211 and Chem 111, is required to pursue the CSE minor.** Minimum of 19 credits are needed to complete the minor. Students can transfer up to 12 credits from their major field. The table on the [next page](#) presents the course of study for a minor degree in CSE. Students must complete all courses with a grade of C or better.

Computational Science and Engineering Minor	
Course Number and Title	Credits
Computer science emphasis Choose three courses from either CLUSTER A or CLUSTER B	10-11
CLUSTER A COMPSCI 117 Introduction to C++ OR COMPSCI 119 Introduction to JAVA COMPSCI 125 Introduction to Computer Science I COMPSCI 225 Introduction to Computer Science II	
CLUSTER B COMPSCI 125 Introduction to Computer Science I COMPSCI 225 Introduction to Computer Science II COMPSCI 253 Object-Oriented Program Development in C	
Scientific computing emphasis Choose one of the following: MATH 365 Introduction to Computational Mathematics PHYS 325 Scientific Computing MATH 465 Numerical Analysis I <i>other scientific computing courses can be included in future</i>	3
Parallel computing emphasis Choose one of the following: ME 471 Parallel Scientific Computing COMPSCI 430 Parallel Computing (have PREREQS not included in the minor) <i>other parallel computing courses can be included in future</i>	3
Choose one course from the list below <i>Students can take other upper division (300 or above) courses that are not included in this list with the approval of their CSE minor advisor.</i> GEOPH 422 Data Analysis and Geostatistics MATH 301 Introduction to Linear Algebra MATH 333 Differential Equations with Matrix Theory MATH 436 Partial Differential Equations MATH 465 Numerical Analysis I MATH 471 Data Analysis ME 430 Fluid Dynamics ME 433 Dynamic Meteorology ME 470 Finite Element Methods PHYS 309 Introductory Modern Physics with Applications MSE 564 Computational Materials Science Computational Science and Engineering Internship (3 credits) <i>*Students are required to submit a final report to their CSE minor advisor.</i>	3-4
Total Credits:	19-21