MINOR IN SCIENTIFIC AND ENGINEERING COMPUTING

The Scientific and Engineering Computing minor provides undergraduate students with computational and numerical skills and knowledge to augment their studies in their major programs. Core courses in mathematics and computing provide broad, general skills in numerical methods, algorithms, and scientific software development. Elective courses provide depth in applying numerical computation to problems in the field of the student’s major.

Computational methods are now used routinely in virtually all fields of science and engineering, and are becoming more common in the social sciences. They have become essential to understand natural and human-created phenomena and systems. Computation has been described as the third paradigm for scientific discovery and innovation, along with theory and experimentation. A minor curriculum in computation is a natural complement to major programs in science, engineering and the social sciences.

Program of Study

A CS Minor application is required.

The Scientific and Engineering Computing minor must comprise at least 15 credit hours, of which at least 9 credit hours are upper-division coursework (numbered 3000 or above).

Prerequisites

- Math through Calculus III and Differential Equations
- CS 1331 Intro-Object Orient Prog

Required Courses

- CX 4010 Computational Prob Solv
- Numerical Methods
  - Select one of the following:
    - AE 3090 Numerical Methods For AE
    - CHBE 2120 ChE Numerical Mthods
    - CX 4640 Numerical Analysis I
    - MATH 4640 Numerical Analysis I
    - ME 2016 Computing Techniques
    - MSE 3025 Stats&Numerical Methods

Intro to Parallel Computing

- Select one of the following:
  - CX 4220 Intro High Perf Comp
  - CX 4777 Vector&Parallel Sci Comp
  - MATH 4777 Vector&Parallel Sci Comp

Electives

- Select two of the following:
  - AE 4040 Computational Fluid Dyn
  - AE 4131 Intro to Finite Element
  - BMED 4783 Intro-Medical Image Proc
  - CS 4710 CS for Bioinformatics
  - CX 4140 Comp Model Algorithms
  - CX 4230 Computer Simulation
  - CX 4240 Computing for Data Analy
  - CX 4641 Numerical Analysis II

CX 4777 Vector&Parallel Sci Comp
CX 4803 Computational Sustainability
ECE 4580 Computer Vision
ECE 4783 Intro-Medical Image Proc
ECE 4823 Computational Methods in Electrical Engineering
ECE 4923 Advanced Programming Techniques for Engineering Apps
MATH 4261 Math Statistics I
MATH 4305 Linear Algebra
MATH 4581 Math Methods in Engr
MATH 4641 Numerical Analysis II
MATH 4777 Vector&Parallel Sci Comp
ME 4342 Computational Fluid Dyn
NRE 4234 Nuc Criticality Safe Eng
PHYS 3266 Computational Physics

Total Credit Hours 15

1 CS 1331 is a pre-requisite for the minor and must be taken, but not included in the required 15 credit hours. A grade of A or B is required.
2 Computer engineering students should take both CX 4220 and CX 4777/MATH 4777 rather than CX 4010.
3 If Numerical Methods is required by the student’s Major, then the student may take an additional elective. Numerical Methods courses include (ECE and computer engineering students are restricted to taking AE 3090, CX 4640/MATH 4640, or MSE 3025)

- No Special Problems or Internships coursework may be used towards the CS minor.
- A grade of A or B is required for CS 1331. All courses used to satisfy the course requirements for a minor must be completed with a grade of C (2.00) or better.
- All courses counting toward the minor must be taken on a letter-grade basis.
- A maximum of 3 credit hours of transfer credit may be used to satisfy the course requirements for a minor. This includes courses taken at another institution or credit earned through the AP or IB program, assuming the scores meet Georgia Tech minimum standards.
- It is the major advisor’s responsibility to verify that students are using only courses from the designated block(s) from the student’s major field of study that are allowed to satisfy a minor program, that they are not using any Core Area A-E courses (including humanities and social sciences), and that they are not using any courses for more than one minor or certificate. Any free elective course used to satisfy the course requirements of the student’s major degree program may also be used to satisfy the course requirements for a minor.

Minor Program of Study & Guidelines (http://www.catalog.gatech.edu/academics/minors)