Approved Program of Study for Undergraduate Minors
Georgia Institute of Technology
Office of the Registrar
2014-2015
Minor in Scientific and Engineering Computing

Please type or print in ink:

Name (first/last):  GT Student ID Number:

GT Email Address:  Daytime Phone:

Major:  Anticipated Graduation Date:

In addition to the guidelines listed below, you are responsible for reviewing and following the general guidelines for minors: [http://www.catalog.gatech.edu/academics/minorguide.php](http://www.catalog.gatech.edu/academics/minorguide.php)

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

- Computer Programming (3 hours)
  Select one: CS 1331 or 1372 or ECE 2036

- Numerical Methods (3 hours)
  Select one: AE 3090 or CHBE 2120 or
  CX 4640 or MATH 4640 or ME 2016 or MSE 3025

- Computational Problem Solving (3 hours)
  CX 4010

- Intro to Parallel Computing (3 hours)
  Select one: CX 4220 or CX 4777 or MATH 4777

- Elective Course (3 hours)
  AE 4040 or AE 4131 or BMED 4783 or CS 4710 or CX 4140 or CX 4220 or CX 4230 or CX 4240 or CX 4641 or CX 4777 or ECE 4580 or ECE 4783 or ECE 4823 or ECE 4893 or MATH 4261 or MATH 4305 or MATH 4581 or MATH 4641 or MATH 4777 or ME 4342 or NRE 4234 or PHYS 3266

Additional details and restrictions for some majors are listed on the follow pages.

It is the major advisor’s responsibility to verify that students are not using any courses required by name and number for their major, 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. Free electives and technical electives may be used towards minors.

List the courses completed for the requested minor:

<table>
<thead>
<tr>
<th>Course and Section</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
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Student Signature:

Major School Signature:

Minor School Signature:
In accordance with Institute guidelines, the minor requires a minimum of 15 hours, including 9 hours at 3xxx or above. 6 hours may be in a student’s major, but these courses cannot also be used to fulfill the requirements of the student’s major. The curriculum includes (1) foundational courses in mathematics and computing, (2) core courses in the minor’s field of study, and (3) one or more courses focusing on application in relevant problem domains. If any of the minor courses listed below are required by the students’ major, the student should substitute an additional elective course in its place. The minor is not available to majors in computer science or computational media.

Prerequisites

1. Math through Calculus III and Differential Equations
2. CS 1371 Computing for Engineers

Required Core Courses (4 core courses, one in each of the following areas)

1. Computer Programming. This course may be taken before the prerequisites have been satisfied. If one of these courses is required by the student’s major, the student should substitute an additional elective. Courses that satisfy this requirement are:
   a. CS 1331 Intro Object-Oriented Prog (Java)
   b. CS 1372 Program Design for Engineers (C)
   c. ECE 2036 Engineering Software Design

2. Numerical Methods. 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/Math 4640, or MSE 3025):
   a. AE 3090 Numerical Methods
   b. ChBE 2120 Numerical Methods
   c. CX/MATH 4640 Numerical Analysis I
   d. ME 2016 Computing Techniques
   e. MSE 3025 Stats and Numerical Methods

3. Computational Problem Solving. Computer engineering students should take both CX 4220 and CX/Math 4777 (see requirement [4]) rather than CX 4010.
   a. CX 4010 Computational Problem Solving for Scientists and Engineers

4. Introduction to Parallel Computing. Courses that satisfy this requirement are:
   a. CX 4220 (formerly CS 4225) Intro to High Performance Computing
   b. CX/MATH 4777 Parallel and Vector Scientific Computing
**Electives**

Students must take one of the following electives.

a. AE 4040 Computational Fluid Dynamics  
b. AE 4131 Intro Finite Element Methods  
c. BMED/ECE 4783 Intro Medical Image Proc  
d. CX 4140 (formerly CS 4140) Computational Modeling Algorithms  
e. CX 4220 (formerly CS 4225) Intro to High Performance Computing  
f. CX 4230 (formerly CS 4335) Modeling and Computer Simulation  
g. CX 4240 (formerly CS 4245) Intro Data Mining and Analysis  
h. CX/MATH 4641 Numerical Analysis II  
i. CS 4710 CS for Bioinformatics  
j. CX/MATH 4777 Parallel and Vector Scientific Computing  
k. ECE 4580 Computational Computer Vision  
l. ECE 4823 Computational Methods in Electrical Engineering (permanent number forthcoming)  
m. ECE 4893 Advanced Programming Techniques for Engineering Apps  
n. MATH 4261 Mathematical Statistics I  
o. MATH 4305 Topics in Linear Algebra  
p. MATH 4581 Classical Math Methods in Engrg  
q. ME 4342 Comput Fluid Dynamics  
r. NRE 4234 Nuclear Criticality Safety Eng (infreq)  
s. PHYS 3266 Computational Physics

No more than 3 semester hours of Special Topics courses may be used. No more than 3 semester hours of Undergraduate Research may be used. No more than 3 semester hours of Special Problems courses may be used.