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). **Requirements include:**

A. A CS Minor application.  
B. Required courses: CX 4010, one course from Numerical Methods, one course from Intro to Parallel Computing, and two Elective courses  
C. No Special Problems or Internships coursework may be used towards the CS minor.  
D. A grade of A or B is required for CS 1301/1315/1371 and CS 1331. All other minor courses must be completed with a grade of C or higher.

**PRE-REQUISITE (hours do not count toward minor):**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Programming (3 hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 1331</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numerical Methods (3 hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one: AE 3090 or CHBE 2120 or CX 4640 or MATH 4640 or ME 2016 or MSE 3025</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational Problem Solving (3 hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CX 4010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intro to Parallel Computing (3 hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one: CX 4220 or CX 4777 or MATH 4777</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Elective Course (3 hours)

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 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.

<table>
<thead>
<tr>
<th>Course and Section</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Student Signature:

Major School Signature:

Minor School Signature:
1. **Prerequisites**
   a. Math through Calculus III and Differential Equations
   b. CS 1331 Introduction to Object Oriented Programming

2. **CX 4010-Computational Problem Solving, 3 hours**
   * Computer engineering students should take both CX 4220 and CX/Math 4777 rather than CX 4010.

3. **Numerical Methods course, 3 hours.** 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

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
5. **Electives, 6 hours. Choose two:**
   
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  
t. CX 4803 SUS Computational Sustainability  

A maximum of 3 semester hours of Special Topics courses may be included in a minor.  
A maximum of 3 semester 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.  
All courses counting toward the minor must be taken on a letter-grade basis.  
All courses used to satisfy the course requirements for a minor must be-completed with a grade of C (2.00) or better.