BACHELOR OF SCIENCE IN COMPUTER SCIENCE - THREAD: THEORY & MEDIA

The Threads™ represent partial paths through the curriculum. Thus, a student weaves a degree from these Threads. Students are not forced to make Thread decisions very early in their academic careers; however, they may if they want. We define the Threads so they are flexible enough to allow for a variety of technical and creative experiences. Threads are coherent enough that students develop computing skills even if their focus shifts as they go along.

The Media thread is where computing meets design. This thread prepares students by helping them to understand the technical and computational capabilities of systems in order to exploit their abilities to provide creative outlets.

The Theory thread is where computing meets itself. Theory teaches students the theoretical and mathematical foundations underlying a wide range of computational disciplines. Early preparation includes discrete mathematics, algorithms, and complexity. Knowledge goals are for students to mature in development and analysis of abstract models for applications ranging from theoretical computer science to computational physics, biology, mathematics, economics, and optimization.

Wellness

APPH 1040 Scientific Foundations of Health
or APPH 1050 The Science of Physical Activity and Health

Core A - Essential Skills
ENGL 1101 English Composition I
ENGL 1102 English Composition II
MATH 1552 Integral Calculus

Core B - Institutional Options
CS 1301 Introduction to Computing

Core C - Humanities
Any HUM (http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/core-area-c)

Core D - Science, Math, & Technology
PHYS 2211 Introductory Physics I
Lab Science
MATH 1551 Differential Calculus
MATH 1554 Linear Algebra

Core E - Social Sciences
Select one of the following:
HIST 2111 The United States to 1877
HIST 2112 The United States since 1877
INTA 1200 American Government in Comparative Perspective
POL 1101 Government of the United States

Core F - Courses Related to Major
Lab Science
CS 1100 Freshman Leap Seminar

Major Requirements
CS 2110 Computer Organization and Programming
CS 3451 Computer Graphics
CS 3510 Design and Analysis of Algorithms
or CS 3511 Design and Analysis of Algorithms, Honors
CS 4510 Automata and Complexity Theory
CS 4540 Advanced Algorithms
MATH 3406 A Second Course in Linear Algebra

Select six credit hours of the following:
CS 4455 Video Game Design and Programming
CS 4460 Introduction to Information Visualization
CS 4464 Computational Journalism
CS 4475 Computational Photography
CS 4480 Digital Video Special Effects
CS 4496 Computer Animation
CS 4590 Principles and Applications of Computer Audio

Select one of the following:
MATH 4022 Introduction to Graph Theory
MATH 4032 Combinatorial Analysis
MATH 4150 Introduction to Number Theory

Other Required Courses
MATH 3012 Applied Combinatorics
Select one of the following:
MATH 3215 Introduction to Probability and Statistics
MATH 3670 Probability and Statistics with Applications
CEE 3770 Statistics and Applications
ISYE 3770 Statistics and Applications
or ISYE 202 Probability with Applications
& ISYE 2028 Basic Statistical Methods

Free Electives
Free Electives

Total Credit Hours 126

Pass-Fail only allowed for Free Electives (max six credit hours), CS 1100, and CS 1171 (if required).

1 Minimum grade of C required.
2 Two of three lab sciences MUST be a sequence.
Junior Design Options are as follows (students must pick one option and may not change):

- Option 1 - LMC 3432, LMC 3431, CS 3311, CS 3312.
- Option 2 - CS 4699 or LMC 4699 (4 credit hours), LMC 4701, LMC 4702.
- Option 3 - ECE VIP courses (ECE 3811, ECE 3812, ECE 4811, ECE 4812) and LMC 3403.

Six credits of the Junior Design option are used as Major Requirements and the overage credits of research/VIP (5 credit hours/2 credit hours) may be used as free electives. Students completing VIP for their junior design requirement will be required to complete at least four semesters of VIP. (VIP 1 + VIP 2 + VIP 3) (for a total of 5 credit hours) + VIP 4 (3 credit hours) = 8 hours of VIP credit. VIP 4 must be taken after 90 credit hours at the 4000 level and be on the same project as 2 of VIP 1-3s.

Two credit hours of MATH 1554 may count along with MATH 2550 to give Area F 18 credit hours.

Cooperative Programs

The College of Computing participates in the undergraduate and graduate Cooperative Programs. See links below for further Information:

- Undergraduate Cooperative Plan (http://www.catalog.gatech.edu/specialacademic/divpro.php)
- Graduate Cooperative Plan (http://www.catalog.gatech.edu/specialacademic/coop.php)

International Plan

The College of Computing (http://www.cc.gatech.edu) has an approved BS CS International Plan that accommodates the unique requirements of this option discussed in the International Plan section of the catalog (http://www.catalog.gatech.edu/academics/special-academic-programs/international-plan).

However, due to the flexible nature of the Threads curriculum, the International Plan designation may not be available with all of the Thread combinations. Efforts will be made to work with interested students to accommodate their individual circumstances with regard to the International Plan designer for the Bachelor of Science in Computer Science.

Research Option

To complete the Research Option in the College of Computing, students must:

1. Complete at least nine units of undergraduate research
   a. Over at least two, preferably three terms
   b. Research may be for either pay or credit;
2. Write an undergraduate thesis/report of research on their findings;
3. Take
   a. LMC 4701: Undergraduate Research Proposal Writing (taken during the first or second semester of research)
   b. LMC 4702: Undergraduate Research Thesis Writing (taken during the thesis writing semester).

Research Classes

The following classes count toward fulfillment of the Research Option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 2699</td>
<td>Undergraduate Research (Freshman and Sophomore)</td>
<td>1-12</td>
</tr>
<tr>
<td>CS 4699</td>
<td>Undergraduate Research (Junior and Senior)</td>
<td>1-12</td>
</tr>
<tr>
<td>CS 4980</td>
<td>Research Capstone Project</td>
<td>1-21</td>
</tr>
</tbody>
</table>

To get credit toward completion of the Research Option for research for pay, students must be registered for the appropriate audit-only, research for pay class (CS 2698 or 4698). If work on research for pay begins after the close of registration and the student has not signed up for the appropriate class, unfortunately it is not possible to get credit toward the Research Option for work that term.

A research project will also fulfill the capstone design requirement if the student registers for CS 4980 for one of the research terms. This is typically done the last semester of research, while taking LMC 4702.

Completion of the Research Option is noted on the student’s transcript. For more information, see www.urop.gatech.edu (http://www.urop.gatech.edu).

Contact Us

General Research Option Information (http://www.catalog.gatech.edu/academics/special-academic-programs/undergraduate-research-opportunities-program)