

BACHELOR OF SCIENCE IN COMPUTER SCIENCE - THREAD: MEDIA & SYSTEMS AND ARCHITECTURE

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 Systems and Architecture thread is where many of the practical skills of computing are learned. Like Theory, Systems and Architecture lies at the center of computing. It prepares students to create and evaluate computer architectures, systems, and languages across a variety of paradigms and approaches.

Code	Title	Credit Hours
Wellness		
APPH 1040	Scientific Foundations of Health	2
	or APPH 10 The Science of Physical Activity and Health	
Core A - Essential Skills		
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
MATH 1552	Integral Calculus	4
Core B - Institutional Options		
CS 1301	Introduction to Computing ¹	3
Core C - Humanities		
	Any HUM (http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/core-area-c/)	6
Core D - Science, Math, & Technology		
PHYS 2211	Introductory Physics I ²	4
	Lab Science ²	4
MATH 1551	Differential Calculus	2
MATH 1554	Linear Algebra ⁴	4
	or MATH 1554 Linear Algebra with Abstract Vector Spaces	
Core E - Social Sciences		
	Select one of the following:	3
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	
PUBP 3000	American Constitutional Issues	
Any SS (http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/core-area-e/)		9

Core F - Courses Related to Major		
	Lab Science ²	4
CS 1100	Freshman Leap Seminar	1
CS 1331	Introduction to Object Oriented Programming ¹	3
CS 1332	Data Structures and Algorithms for Applications ¹	3
CS 2050	Introduction to Discrete Mathematics for Computer Science ¹	3
	or CS 2051 Honors - Induction to Discrete Mathematics for Computer Science	
MATH 2550	Introduction to Multivariable Calculus ⁴	2
Major Requirements		
CS 2340	Objects and Design ¹	3
CS 4001	Computing, Society, and Professionalism ¹	3
	or CS 4002 Robots and Society	
	or CS 4726 Privacy, Technology, Policy, and Law	
	or SLS 3110 Technology and Sustainable Community Development	
Junior Design Options (Capston)		
	Junior Design Option ^{1,3}	6
Concentration		
CS 2110	Computer Organization and Programming ¹	4
CS 2200	Computer Systems and Networks ¹	4
CS 3210	Design of Operating Systems ¹	3
CS 3220	Computer Structures: Hardware/Software Codesign of a Processor ¹	3
ECE 2031	Digital Design Laboratory ¹	2
CS 3451	Computer Graphics ¹	3
CS 3510	Design and Analysis of Algorithms ¹	3
	or CS 3511 Design and Analysis of Algorithms, Honors	
	Select six credit hours of the following for Media Technologies: ¹	6
	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 for Advanced Systems Architectures: ¹	3
	CS 4210 Advanced Operating Systems	
	CS 4220 Programming Embedded Systems	
	CS 4290 Advanced Computer Organization	
	Select one of the following for Systems Software Tools: ¹	3
	CS 3300 Introduction to Software Engineering	
	CS 4240 Compilers, Interpreters, and Program Analyzers	
Other Required Courses		
MATH 3012	Applied Combinatorics	3
	Select one of the following:	3
	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 2077 Probability with Applications
& ISYE 2088 Basic Statistical Methods

Free Electives	
Free Electives	11
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.
- ³ 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 - ECE VIP courses and LMC 3403.
 - Option 3 - Satisfy Georgia Tech Research Option.
 - Option 4- CS 2701 (3 hours), CS 4699-I2P (3 hours), LMC 3403 (3 hours) = 9 hours OR CS 4699- I2P (6 hours), LMC 3403 (3 hours) = 9 hours

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 three semesters of VIP. (VIP 1 + VIP 2 + VIP 3) (for a total of 5 credit hours) + LMC 3403 = 8 hours of VIP credit. Students using CREATE-X for junior design take at least 6 hours of CREATE-X Start-up Lab and Idea 2 Prototype (I2P) and 3 of the 6 hours must be I2P. Students take these 6 hours with LMC 3403 (3 hours) for a total of 9 hours. Extra three hours for CREATE-X option can be used in free electives.

- ⁴ 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://catalog.gatech.edu/academics/special-academic-programs/experiential-education/center-career-discovery-development/>)
- Graduate Cooperative Plan (<http://catalog.gatech.edu/academics/special-academic-programs/experiential-education/graduate-cooperative-plan/>)

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 designator 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:

Research for Credit

Code	Title	Credit Hours
CS 2699	Undergraduate Research (Freshman and Sophomore)	1-12
CS 4699	Undergraduate Research (Junior and Senior)	1-12
CS 4980	Research Capstone Project	1-21

Research for Pay (Audit only)

Code	Title	Credit Hours
CS 2698	Undergraduate Research Assistantship (Freshman and Sophomore)	1-12
CS 4698	Undergraduate Research Assistantship (Junior and Senior)	1-12

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>).

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

BS/MS in Computer Science

Students who want to pursue

the BS/MS option must apply to the MSCS program after completing at least 60 hours of work towards the BSCS degree. Applicants should have

a cumulative GPA of at least 3.4. This GPA must be maintained for the student to take graduate level courses.

Students admitted to the program will take 6 hours during their final undergraduate year to double count in both their BSCS and MSCS degrees; they should choose 3 hours of MS Core or Elective hours their fall semester and 3 hours of MS Core or Elective hours their spring semester that can count toward their thread hours and CS Specialization hours.

Visit College of Computing (<https://www.cc.gatech.edu/>) for more information.