COMPUTER SCIENCE | CLAS

This program combines the study of computer science with a liberal arts education. It prepares students for employment as computing professionals while offering significant freedom to choose coursework in other areas. The major is especially popular with students who want the technical education in computer science with the flexibility to take other non-technical courses, sometimes in the form of a minor or certificate.

About this Program

- **College:** Liberal Arts and Sciences (https://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/)
- **Degree:** Bachelor of Science
  - **Specialization:** Cybersecurity (https://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/CSC_BS/CSC_BS01/)
- **Credits for Degree:** 120
- **More Info**

To graduate with this major, students must complete all university, college, and major requirements.

Department Information

The mission of the Department of Computer & Information Science & Engineering is to educate students, as well as the broader campus community, in the fundamental concepts of the computing discipline; to create and disseminate computing knowledge and technology; and to use expertise in computing to help society solve problems.
Website (https://www.cise.ufl.edu/)

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Map (http://campusmap.ufl.edu/#/index/0042)

Curriculum

- /UGRD/colleges-schools/UGENG/CPE_BSCO03/
- Combination Degrees
- Computer and Information Science and Engineering Minor
- Computer and Information Science and Engineering Minor UF Online
- Computer Science UF Online
- Computer Science | CLAS
- Computer Science | Herbert Wertheim College of Engineering
- Digital Arts and Sciences | Bachelor of Science
- Industrialized Construction Engineering

Overview

Computer science majors in CLAS take a solid foundation of core computer science courses while fulfilling requirements for a liberal arts education, including courses from the humanities, social and behavioral sciences, and the study of a foreign language. Questions about the major should be directed to a department advisor.

Requirements for the Major

This major requires a minimum of 29 credits in foundation coursework, 35 credits in core coursework, and 9 credits of major electives. An exit interview is required in the student's last semester.

Students must earn minimum grades of C in coursework for the major. A student can request to transfer in a maximum of four courses toward required core Computer Science or required Computer Science elective coursework, dependent upon courses being deemed equivalent by the Department. Course equivalency requests should begin with the department advising office, followed by the undergraduate coordinator.

Students may opt to take COP 3504C (https://catalog.ufl.edu/search/?P=COP%203504C) in lieu of COP 3502C (https://catalog.ufl.edu/search/?P=COP%203502C) and COP 3503C (https://catalog.ufl.edu/search/?P=COP%203503C). If elected, students will need to complete an additional 4 credits to complete the degree program.

Code	Title	Credits
Required Foundational Coursework		
Select one:		3
ENC 3246	Professional Communication for Engineers	
ENC 2210	Technical Writing	
ENC 2256	Writing in the Disciplines	
MAC 2311	Analytic Geometry and Calculus 1	4
MAC 2312	Analytic Geometry and Calculus 2	4
MAC 2313	Analytic Geometry and Calculus 3	4
MAS 4105	Linear Algebra 1	3-4
or MAS 3114	Computational Linear Algebra	
Select one:		4-5
PHY 2048	Physics with Calculus 1	
& 2048L	and Laboratory for PHY 2048	
PHY 2053	Physics 1	
& 2053L	and Laboratory for PHY 2053	
Select one:		4-5
PHY 2049	Physics with Calculus 2	
& 2049L	and Laboratory for PHY 2049	
PHY 2054	Physics 2	
& 2054L	and Laboratory for PHY 2054	
STA 3032	Engineering Statistics	3
Total Foundational Coursework: 29-32 credits		
Required Computing Core Coursework		
COP 3502C	Programming Fundamentals 1	4
COP 3503C	Programming Fundamentals 2	4
COT 3100	Applications of Discrete Structures	3
COP 3530	Data Structures and Algorithm	3
Required Major Core Coursework		
CDA 3101	Introduction to Computer Organization	3
CEN 3031	Introduction to Software Engineering	3
CIS 4301	Information and Database Systems 1	3
CIS 4914	Senior Project	3
or EGN 4952	Integrated Product and Process Design 2	
COP 4020	Programming Language Concepts	3
COP 4533	Algorithm Abstraction and Design	3
COP 4600	Operating Systems	3
Required Major Electives [1]		**9**
Any 4000-level or higher CISE course, beyond the Core Requirements		
EEL 3701C	Digital Logic and Computer Systems	
EEL 4712C	Digital Design	
EEL 4713C	Digital Computer Architecture	
EEL 4744C	Microprocessor Applications	
EGN 4951	Integrated Product and Process Design 1	
EGN 4912	Engineering Directed Independent Research (8 credits maximum in conjunction with CIS 4905)	
CIS 4940	Practical Work (advisor approval, 1 credit, repeatable up to 3 credits)	
CIS 4949	Co-Op Work in CISE (advisor approval, 1 credit, repeatable up to 3 credits)	
CIS 4905	Individual Study in CISE	
Total Major Coursework: 44 credits		
Total Credits		**73-76**

1 Students needing to satisfy the General Education Composition requirement should take ENC 2210 or ENC 2256 . Students who do not need the Composition credit should take ENC 3246. The ENC course must be completed with a C or better. A grade of C- or lower will not fulfill degree requirements.

2 Students should check prerequisites when planning their major electives. Students should discuss electives with an advisor in the department. Individual study, co-op, internship, research, and special topics credits must be approved by an advisor in the department.
COP 3054C may replace COP 3502C and COP 3503C if students have prior programming experience. If a student opts for COP 3504C, an additional 4 credit hours of electives is required.

Critical Tracking

Critical Tracking records each student's progress in courses that are required for progress toward each major. Please note the critical-tracking requirements below on a per-semester basis.

For degree requirements outside of the major, refer to CLAS Degree Requirements: Structure of a CLAS Degree.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites (https://cpm.flvc.org/advance-search/) may be used for transfer students.

Semester 1

- Complete MAC 1147 or MAC 2311
- 2.0 UF GPA required

Semester 2

- Complete MAC 2311
- 2.0 UF GPA required

Semester 3

- Complete MAC 2312
- 2.0 UF GPA required

Semester 4

- Complete MAC 2313; and PHY 2053/PHY 2053L or PHY 2048/PHY 2048L
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete COP 3502C or COP 3504C; and PHY 2054/PHY 2054L or PHY 2049/PHY 2049L
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 6

- Complete COP 3503C or COP 3504C; and COT 3100
- 2.0 UF GPA required

Semester 7

- Complete COP 3530
- 2.0 UF GPA required

Semester 8

- Complete COP 4600
- 2.0 UF GPA required

Model Semester Plan

Students are expected to complete the Writing, Civic Literacy, summer enrollment, and Quest requirements while in the process of taking the courses below. Students are also expected to complete the general education international (GE-N) requirements concurrently with another general education requirement (typically, GE-C, H, or S) as part of the CLAS Basic Distribution requirements. One of the two general education mathematics courses must be a pure math course.

College of Liberal Arts and Sciences allows students additional flexibility in its Distribution Requirements. Students may count a maximum of 6 credits TOTAL from the CLAS Distribution course lists towards Humanities, Social and Behavioral Sciences, or Biological and Physical Sciences, with no more than 3 credits of Humanities, 3 credits of Social and Behavioral Sciences, or 6 credits of Biological or Physical Sciences.

The full list of major-specific requirements for this major can be found on the Overview tab. College of Liberal Arts and Sciences degree requirements can be found on the College's degree requirements page (https://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/#degreerequirementstext).

ENC 3246, MAC 2312, MAC 2313, PHY 2049, PHY 2049L, PHY 2054, PHY 2054L, STA 3032, MAS 3114, and MAS 4105 may count towards 3000-level or above electives outside of the major.

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Course	Title	Credits
Semester One		
Quest 1		3
COP 3502C	Programming Fundamentals 1 (**Critical Tracking**)	4
MAC 2311	Analytic Geometry and Calculus 1 (**Critical Tracking**; Gen Ed Mathematics)	4
State Core Gen Ed Composition (https://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext); Writing Requirement		3
	Credits	**14**
Semester Two		
COP 3503C	Programming Fundamentals 2 (**Critical Tracking**)	4
COT 3100	Applications of Discrete Structures (**Critical Tracking**)	3
MAC 2312	Analytic Geometry and Calculus 2 (**Critical Tracking**; Gen Ed Mathematics)	4
Select one:		4-5
PHY 2048 & 2048L	Physics with Calculus 1 and Laboratory for PHY 2048 (**Critical Tracking**; State Core Gen Ed Physical Sciences)	
PHY 2053 & 2053L	Physics 1 and Laboratory for PHY 2053 (**Critical Tracking**; State Core Gen Ed Physical Sciences)	
	Credits	**15-16**
Summer After Semester Two		
Gen Ed Biological Sciences		3
State Core Gen Ed Social and Behavioral Sciences (https://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
State Core Gen Ed Humanities (https://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
	Credits	**9**
Semester Three		
CDA 3101	Introduction to Computer Organization	3
COP 3530	Data Structures and Algorithm (**Critical Tracking**)	3
MAC 2313	Analytic Geometry and Calculus 3 (**Critical Tracking**; Gen Ed Mathematics)	4
Select one:		4-5
PHY 2049 & 2049L	Physics with Calculus 2 and Laboratory for PHY 2049 (**Critical Tracking**; Gen Ed Physical Sciences)	
PHY 2054 & 2054L	Physics 2 and Laboratory for PHY 2054 (**Critical Tracking**; Gen Ed Physical Sciences)	
	Credits	**14-15**
Semester Four		
Quest 2		3
CEN 3031	Introduction to Software Engineering	3
CIS 4301	Information and Database Systems 1	3
ENC 2210 or ENC 2256 or ENC 3246	Technical Writing (Gen Ed Composition; Writing Requirement) or Writing in the Disciplines or Professional Communication for Engineers	3
MAS 3114 or MAS 4105	Computational Linear Algebra or Linear Algebra 1	3-4
	Credits	**15-16**
Semester Five		
COP 4600	Operating Systems (**Critical Tracking**)	3
STA 3032	Engineering Statistics	3
CLAS Foreign Language Proficiency Requirement [1]		4-5
Gen Ed Social and Behavioral Sciences		3
	Credits	**13-14**
Semester Six		
COP 4020	Programming Language Concepts	3
COP 4533	Algorithm Abstraction and Design	3

CLAS Foreign Language Proficiency Requirement [1]		3-5
Gen Ed Humanities		3
	Credits	**12-14**
Summer After Semester Six		
Pursue Internship/Co-op (if desired)		0
	Credits	**0**
Semester Seven		
Gen Ed Social and Behavioral Sciences		3
Gen Ed Humanities		3
Major electives		6
Elective (or CLAS Foreign Language Proficiency Requirement if 4-3-3 language option) [1]		3
	Credits	**15**
Semester Eight		
CIS 4914	Senior Project	3
or EGN 4952	or Integrated Product and Process Design 2	
Major elective		3
Electives		4
Gen Ed Biological Sciences		3
	Credits	**13**
	Total Credits	**120**

[1] CLAS Foreign Language Proficiency Requirement (https://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/#degreerequirementstext)

Academic Learning Compact

The College of Liberal Arts and Sciences' Computer Science program exposes students to a broad range of disciplines, including programming languages, theory of computer science, physical science, mathematics, and software engineering. Students will graduate with the ability to apply knowledge of science and mathematics to computer science problems, to design computer systems or components to satisfy users' needs and to communicate technical information regarding computer systems to other computer scientists. This program emphasizes the broader aspects of computer science and is less technical in depth than the computer science program in the Herbert Wertheim College of Engineering.

Before Graduating Students Must

- Pass assessment according to department rubric of student performance on a major design experience.
- Pass assessment in one or more core courses or individual assignments targeted to each SLO.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes | SLOs

Content

1. Apply knowledge of mathematics and science to computer science problems.
2. Design a computing system, component, or process, analyzing and interpreting the data.
3. Use the techniques, skills, and tools necessary for computer science practice.

Critical Thinking

4. Design a computing system, component, or process to meet desired needs within realistic economic, environmental, social, political, ethical, and health and safety constraints.
5. Identify, formulate, and solve computer science problems.

Communication

6. Communicate technical data and design information effectively in writing, in speech, and in multidisciplinary teams to other computer scientists.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Courses	SLO 1	SLO 2	SLO 3	SLO 4	SLO 5	SLO 6
CDA 3101	R		R	R	R	
CEN 3031						I, A

CIS 4914	A	A	A	A	A	A
COP 3504			I	I	I	
COP 3530	R		R		R	
COP 4600			A	R		
COT 3100	I		R			
COT 4501	A	I, A			R	

Assessment Types

- Written assignments
- Exams
- Oral reports/presentations
- Exit survey