

Computer Science B.S.C.S.

TOTAL DEGREE HOURS: 120

[Plans of Study](#)

The Computer Science program focuses on the design, development, and application of software systems. Additional course work in algorithms, discrete structures, object-oriented design and data structures, operating systems, digital logic design, computer architecture, operating systems, software engineering, secure computing and a wide range of advanced electives including artificial intelligence (AI) topics extend and supplement the core.

Mission Statement

The mission of the Bellini College of Artificial Intelligence, Cybersecurity and Computing is to transform the role of computing technologies in society by focusing on three key areas:

Delivering High-Demand Academic Programs: Deliver a comprehensive range of undergraduate, graduate, and professional majors, both disciplinary and interdisciplinary, in artificial intelligence, cybersecurity and computing. The majors are pedagogically effective and designed with high standards to be rigorous, relevant and meet the current and future needs of industry, government and society.

Advancing Research Excellence: Focus on innovative investigations and technological advances to elevate the state of artificial intelligence, cybersecurity and computing research. Push the boundaries of knowledge in our fields, facilitating collaboration and innovation across all academic disciplines and fostering an environment that encourages curiosity, creativity and critical thinking.

Promoting Ethics and Trust: Instill a deep sense of responsibility in our students and faculty, emphasizing the importance of secure and trustworthy technology. Through research, curricula, industry partnerships and community engagement, promote ethically driven policies and practices that protect privacy, ensure security and foster social good.

Program Educational Objectives and Student Outcomes

The Bellini College has established the following program educational objectives for Computer Science graduates.

Objective 1: Our graduates will apply their knowledge and skills to succeed in their careers and/or obtain advanced degrees.

Objective 2: Our graduates will function ethically and responsibly, and will remain informed through continuing education, and involved as full participants in their profession and society.

Objective 3: Our graduates will creatively solve problems, communicate effectively, and successfully function in multi-disciplinary teams.

Objective 4: Our graduates will apply principles and best practices of computing grounded in mathematics and science to successfully complete software-related projects to meet customer business objectives and/or productively engage in research.

The following are the Student Outcomes. Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

University Admissions - Bellini College of AI, Cybersecurity and Computing

Admission to the University and College is based on the University's Undergraduate Admission Requirements that may be found by clicking on the following URLs:

Freshman: <https://www.usf.edu/admissions/freshmen/admission-information/requirements-deadlines.aspx>

Transfer: <https://www.usf.edu/admissions/transfer/admission-information/index.aspx>

International: <https://www.usf.edu/admissions/international/admission-information/index.aspx>

For Admission information specific to the Bellini College, see the information at [Bellini College of Artificial Intelligence, Cybersecurity, and Computing](#).

Progression Requirements in the Upper Division

Computer Science students who have fully met the below requirements and are in good academic standing, may progress into the upper level of the major. Prior to progression into the upper level, a student may take no more than two upper-level Bellini College courses. The college may have continuation requirements, which specify minimum performance standards in core major courses which must be met before further registration is granted.

1. Ability to register for [COP 4530 - Data Structures](#)
2. A minimum overall GPA of 2.0
3. A minimum USF GPA of 2.0

College Policies

In addition to the already stated Bellini College graduation requirements, the college has the following additional policy:

- Exit interview and/or survey as a graduation requirement.

Required Courses: (86 credit hours)

State Mandated Common Course Prerequisites - Computer Science B.S.C.S. (25 Credit Hours)*

Following Florida BOG Regulation 8.010, state mandated common course prerequisites are lower-division courses that

are required for progression into the upper division of a particular baccalaureate degree program.

Transfer students should complete the State Mandated Common Course Prerequisites at the lower level prior to entering the university. If these courses are not taken at a Florida College System institution, they must be completed before the degree is granted. Successful completion of the common prerequisites alone does not guarantee a student admission into the degree program.

Unless stated otherwise, a grade of C is the minimum acceptable grade in prerequisite courses.

- COP XXXX** - 3 credit hours
- MAC X311 **OR** MAC X281 Calculus I - 4 credit hours**
- MAC X312 **OR** MAC X282 Calculus II - 4 credit hours**
- (PHY X048 **AND** PHY X048L **OR** PHY X048C General Physics I with Lab - 4 credit hours**
- (PHY X049 **AND** PHY X049L **OR** PHY X049C General Physics I with Lab - 4 credit hours**
- XXX XXXX*** - 6 credit hours

* All state common prerequisite courses count towards major requirements and are not additional credit hours

** Introductory Programming in C, C++, Java, or equivalent language. Choose programming language required by the university to which the student wishes to transfer.

*** Science courses for Science majors.

State Mathematics Pathway - Computer Science B.S.C.S. (7 Credit Hours)*

The Computer Science B.S.C.S. uses the Algebra through Calculus Mathematics Pathway with the following requirements:

- [MAC 1105 - College Algebra](#) Credit(s): 3 **
- [MAC 2311 - Calculus I](#) Credit(s): 4

* Mathematics Pathway courses count towards the State Common Prerequisite math courses and are not additional credits.

** Students may place out of MAC 1105 and begin at a higher-level math class.

Major Core Courses: 23 courses; 59 credit hours

Math and Science Courses: 9 courses; 24 credit hours

- [COT 3100 - Introduction to Discrete Structures](#) Credit(s): 3
- [EGN 2440 - Probability and Statistics with Calculus](#) Credit(s): 3
- [EGN 4450 - Introduction to Linear Systems](#) Credit(s): 2
- [MAC 2311 - Calculus I](#) Credit(s): 4
- [MAC 2312 - Calculus II](#) Credit(s): 4
- [PHY 2048 - General Physics I - Calculus Based](#) Credit(s): 3
- [PHY 2048L - General Physics I Laboratory](#) Credit(s): 1
- [PHY 2049 - General Physics II - Calculus Based](#) Credit(s): 3
- [PHY 2049L - General Physics II Laboratory](#) Credit(s): 1

Specialization Courses: 14 courses; 35 credit hours

- [CDA 3103 - Computer Organization](#) Credit(s): 3
- [CDA 3201 - Computer Logic and Design](#) Credit(s): 3
- [CDA 3201L - Computer Logic and Design Lab](#) Credit(s): 1
- [CDA 4205L - Computer Architecture Lab](#) Credit(s): 1
- [CDA 4205 - Computer Architecture](#) Credit(s): 3
- [CEN 4020 - Software Engineering](#) Credit(s): 3
- [CIS 1930 - Freshman Seminar for Computing](#) Credit(s): 0
- [CIS 4250 - Ethical Issues and Professional Conduct](#) Credit(s): 3
- [CNT 4419 - Secure Coding](#) Credit(s): 3
- [COP 2510 - Programming Concepts](#) Credit(s): 3
- [COP 3514 - Program Design](#) Credit(s): 3
- [COP 4530 - Data Structures](#) Credit(s): 3
- [COP 4600 - Operating Systems](#) Credit(s): 3
- [COT 4400 - Analysis of Algorithms](#) Credit(s): 3

Major Electives: 7 courses; 21 credit hours

Computer Science students must choose 9 hours of software electives, 3 hours of theory electives, and an additional non-overlapping 9 hours of CSE electives ("software", "hardware", "AI", or "theory") in the College.

The undergraduate section of the Bellini College website contains the most up to date list of approved computer science electives. Additional electives may be available with a special topics course number (typically, [CIS 4930](#)). The prerequisite for most, but not all, college upper-level technical electives is [CDA 3201 - Computer Logic and Design](#) and [COP 4530 - Data Structures](#). Consult with the undergraduate Bellini College advising team to learn more about available electives. A maximum of six (6) hours of [CIS 4900](#) and/or any other supervised individual study (including [CIS 4915](#) and [CIS 4940](#)) are allowed as computer science electives.

Software Electives: 9 credit hours

- [CAI 4002 - Introduction to Artificial Intelligence](#) Credit(s): 3
- [CAI 4841 - Computer Vision](#) Credit(s): 3
- [CAI 4842 - Image Processing Fundamentals](#) Credit(s): 3
- [CAP 4034 - Computer Animation Fundamentals](#) Credit(s): 3
- [CAP 4103 - Mobile Biometrics](#) Credit(s): 3
- [CAP 4111 - Introduction to Augmented and Virtual Reality](#) Credit(s): 3
- [CAP 4160 - Brain-Computer Interfaces](#) Credit(s): 3
- [CAP 4628 - Affective Computing](#) Credit(s): 3
- [CAP 4641 - Natural Language Processing](#) Credit(s): 3
- [CAP 4662 - Introduction to Robotics](#) Credit(s): 3
- [CAP 4744 - Interactive Data Visualization](#) Credit(s): 3
- [CAP 4773 - Social Media Mining](#) Credit(s): 3
- [CDA 4621 - Control of Mobile Robots](#) Credit(s): 3
- [CEN 4072 - Software Testing](#) Credit(s): 3
- [CIS 4345 - Big Data Storage and Analysis with Hadoop](#) Credit(s): 3

- [CNT 4004 - Computer Networks I](#) Credit(s): 3
- [CNT 4411 - Computing and Network Security](#) Credit(s): 3
- [COP 4020 - Programming Languages](#) Credit(s): 3
- [COP 4365 - Software System Development](#) Credit(s): 3
- [COP 4520 - Computing in Massively Parallel Systems](#) Credit(s): 3
- [COP 4620 - Compilers](#) Credit(s): 3
- [COP 4710 - Database Design](#) Credit(s): 3

Theory Electives: 3 credit hours

- [CIS 4212 - Privacy-Preserving and Trustworthy Cyber-Infrastructures](#) Credit(s): 3
- [COT 4210 - Automata Theory and Formal Languages](#) Credit(s): 3
- [COT 4521 - Computational Geometry](#) Credit(s): 3
- [COT 4601 - Quantum Computing and Quantum Algorithms](#) Credit(s): 3

Technical Electives: 9 credits hours

- [CAI 4002 - Introduction to Artificial Intelligence](#) Credit(s): 3
- [CAI 4841 - Computer Vision](#) Credit(s): 3
- [CAI 4842 - Image Processing Fundamentals](#) Credit(s): 3
- [CAP 4034 - Computer Animation Fundamentals](#) Credit(s): 3
- [CAP 4103 - Mobile Biometrics](#) Credit(s): 3
- [CAP 4111 - Introduction to Augmented and Virtual Reality](#) Credit(s): 3
- [CAP 4160 - Brain-Computer Interfaces](#) Credit(s): 3
- [CAP 4628 - Affective Computing](#) Credit(s): 3
- [CAP 4641 - Natural Language Processing](#) Credit(s): 3
- [CAP 4662 - Introduction to Robotics](#) Credit(s): 3
- [CAP 4744 - Interactive Data Visualization](#) Credit(s): 3
- [CAP 4773 - Social Media Mining](#) Credit(s): 3
- [CDA 4203 - Computer System Design](#) Credit(s): 3
- [CDA 4203L - Computer System Design Lab](#) Credit(s): 1
- [CDA 4213 - CMOS-VLSI Design](#) Credit(s): 3
- [CDA 4213L - CMOS-VLSI Design Lab](#) Credit(s): 1
- [CDA 4253 - Field Programmable Gate Array System Design and Analysis](#) Credit(s): 3
- [CDA 4321 - Cryptographic Hardware and Embedded Systems](#) Credit(s): 3
- [CDA 4322 - Principles of Secure Hardware Design](#) Credit(s): 3
- [CDA 4323 - Practical Hardware Security](#) Credit(s): 3
- [CDA 4621 - Control of Mobile Robots](#) Credit(s): 3
- [CEN 4072 - Software Testing](#) Credit(s): 3
- [CIS 4212 - Privacy-Preserving and Trustworthy Cyber-Infrastructures](#) Credit(s): 3
- [CIS 4345 - Big Data Storage and Analysis with Hadoop](#) Credit(s): 3
- [CIS 4900 - Independent Study in Computer Science](#) Credit(s): 1-5
- [CIS 4910 - Computer Science and Engineering Project](#) Credit(s): 3
- [CIS 4915 - Supervised Research in Computer Science](#) Credit(s): 0-5
- [CIS 4930 - Special Topics in Computer Science I](#) Credit(s): 1-3 (See department website for list of approved

topics)

- [CIS 4940 - Industry Internship](#) Credit(s): 0-6
- [CNT 4004 - Computer Networks I](#) Credit(s): 3
- [CNT 4411 - Computing and Network Security](#) Credit(s): 3
- [COP 4020 - Programming Languages](#) Credit(s): 3
- [COP 4365 - Software System Development](#) Credit(s): 3
- [COP 4520 - Computing in Massively Parallel Systems](#) Credit(s): 3
- [COP 4620 - Compilers](#) Credit(s): 3
- [COP 4710 - Database Design](#) Credit(s): 3
- [COT 4210 - Automata Theory and Formal Languages](#) Credit(s): 3
- [COT 4521 - Computational Geometry](#) Credit(s): 3
- [COT 4601 - Quantum Computing and Quantum Algorithms](#) Credit(s): 3

Industry Internship

The college recommends that BSCS students complete an industry internship. Students may earn up to six credit hours, as elective, for [CIS 4940 - Industry Internship](#) Credit. No more than three credit hours in any one given company. Internships for CIS 4940 for computer science students must be in the area of software development.

Additional Information - Computer Science B.S.C.S.

GPA Requirements

Students must have and maintain a minimum 2.0 semester GPA, 2.0 Math and Science GPA, 2.0 Specialization GPA, 2.0 USF GPA, and 2.0 overall GPA.

Grading Requirements

Unless otherwise stated in the course prerequisites on [USF Course Inventory](#), the minimum acceptable grade in all BSCS required courses is a C or higher (C- is insufficient).

Residency Requirements

Transfer students must complete a minimum number of approved specialization courses in the major at USF. The minimum number of USF specialization credit hours required is established by the respective academic department or college. In no case will this be less than 18 hours. Basic engineering courses are not considered specialization courses. The University residency requirement must also be met.

A concurrent degree (dual degree) student must meet the requirements of each major and have a minimum of 18 approved specialization hours taken in the degree granting department or college beyond those specialization hours required for the first degree.

Internship Opportunities

The Bellini College and the USF Center for Career and Professional Development Cooperative Education (Co-Op)

program provides services for students interested in experiential educational experiences. A wide variety of industries and government agencies offer internships and cooperative education employment opportunities for students. Participants gain valuable expertise in practical applications and other aspects of operations and development in a professional environment. Students normally apply for participation in this program during their first year and pursue actual internships during their sophomore, junior and senior years. **See the Bellini College advising team for more information on earning academic credit for internships.**

Bachelor's/Master's Pathways

Students majoring in Computer Science have the option to pursue the following Bachelor's/Master's Pathway:

- BS in Computer Science and MS in Computer Science

For more information, see the [Graduate Catalog](#).

Accreditation Information

The Computer Science (B.S.) program is accredited by the Computing Accreditation Commission of ABET, <https://www.abet.org>, under the General Criteria and Program Criteria for Computer Science and Similarly Named Computing Programs.

Research Opportunities - Bellini College of AI, Cybersecurity and Computing

Undergraduate students in any degree program are able to participate in undergraduate research. Several options exist to show mentored undergraduate research activity on a student's official transcript. Those who wish to enroll in an undergraduate research course should consult with their academic advisor to understand how the credit will apply towards the degree requirements. If no credit is needed, students may be eligible to enroll in the 0-credit [IDS 4914 - Advanced Undergraduate Research Experience](#) course. This course will not impact degree credits or GPA but will show on an official transcript and document the experience. The [Office of Student Engagement in Research and Innovation \(SERI\)](#) is able to assist with further inquiries.

Advising Information - Computer Science B.S.C.S.

Bellini College Undergraduate Advisors: <https://www.usf.edu/ai-cybersecurity-computing/academics/undergraduate/advising>.

Plans of Study - Computer Science B.S.C.S.

- [Computer Science B.S.C.S. - 2 Year Plan of Study](#)
 - [Computer Science B.S.C.S. - 4 Year Plan of Study](#)
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