

COMPUTER SCIENCE, B.S.C.S.

Accreditation

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

Learning Outcomes

1. Students will demonstrate an ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Students will demonstrate an ability to 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. Students will demonstrate an ability to communicate effectively in a variety of professional contexts.
4. Students will recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Students will demonstrate the ability to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Students will demonstrate the ability to apply computer science theory and software development fundamentals to produce computing-based solutions.

Academic Standards

Program GPA

Program GPA requirement policies are described in the College of Engineering and Computing section of this bulletin. For the purpose of these policies, the following courses are used to determine the Program GPA for the Computer Science B.S.C.S. program: all Lower Division Computing, Computer Science Major, and Computer Science Elective courses, and CSCE 390.

Exclusions

No Lower Division Computing, Computer Engineering Major, or Computer Engineering Elective course may be counted toward a minor. All other required courses and electives may be used for a minor as appropriate. CSCE 101 and CSCE 102 are not major courses and may not be used for degree credit.

Minimum Course Grades

The Computer Science B.S.C.S. program requires that a grade of "C" or better be earned in each of the following courses: ENGL 101, ENGL 102, MATH 141, MATH 142, MATH 374, CHEM 111, CHEM 111L, or PHYS 211, and all CSCE courses applied to the degree.

Admissions

Entrance Requirements

Admission requirements and processes for freshman, transfer students, and former students seeking readmission are managed by the Office of Undergraduate Admissions (http://sc.edu/about/offices_and_divisions/undergraduate_admissions/).

Transfer applicants from regionally accredited colleges and universities must have a cumulative 2.75 GPA on a 4.00 scale to enter the College of Engineering and Computing. In addition, transfer applicants for the Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, or Mechanical Engineering majors must also have completed a four semester-hour calculus course equivalent to MATH 141 with a grade of "C" or better.

Current University of South Carolina students who wish to enter the College of Engineering and Computing, and former students seeking readmission, must have an institutional GPA of 2.50 or better on at least 15 hours earned at USC. In addition, such applicants for the Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, or Mechanical Engineering majors must also have completed a four semester-hour calculus course equivalent to MATH 141 with a grade of "C" or better.

Degree Requirements (120 hours)

See College of Engineering and Computing (<https://academicbulletins.sc.edu/undergraduate/engineering-computing/>) for progression requirements and special academic opportunities.

Program of Study

| Requirements | Credit Hours |
|-------------------------|--------------|
| 1. Carolina Core | 35-41 |
| 2. College Requirements | 0 |
| 3. Program Requirements | 46-55 |
| 4. Major Requirements | 30-33 |

Founding Documents Requirement

All undergraduate students must take a 3-credit course or its equivalent with a passing grade in the subject areas of History, Political Science, or African American Studies that covers the founding documents including the United State Constitution, the Declaration of Independence, the Emancipation Proclamation and one or more documents that are foundational to the African American Freedom struggle, and a minimum of five essays from the Federalist papers. This course may count as a requirement in any part of the program of study including the Carolina Core, the major, minor or cognate, or as a general elective. Courses that meet this requirement are listed here (<https://academicbulletins.sc.edu/undergraduate/founding-document-courses/>).

1. Carolina Core Requirements (35-41 hours)

CMW – Effective, Engaged, and Persuasive Communication: Written (6 hours)

Must be passed with a grade of C or higher.

- ENGL 101
- ENGL 102

ARP – Analytical Reasoning and Problem Solving (8 hours)

Must be passed with a grade of C or higher.

- MATH 141
- MATH 142

SCI – Scientific Literacy (8 hours)

Select all of one of the following:

Either

- CHEM 111 & CHEM 111L - *both must be passed with a grade of C or higher*
- CHEM 112 & CHEM 112L

or

- PHYS 211 & PHYS 211L - *both must be passed with a grade of C or higher*
- PHYS 212 & PHYS 212L

GFL – Global Citizenship and Multicultural Understanding: Foreign Language (0-6 hours)

Score two or better on foreign language placement test; or complete the 109 and 110 courses in FREN, GERM, LATN or SPAN; or complete the 121 course in another foreign language.

- CC-GFL courses (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)

- any CC-GHS course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)

- any CC-GSS course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

AIU – Aesthetic and Interpretive Understanding (3 hours)

- any CC-AIU course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

CMS – Effective, Engaged, and Persuasive Communication: Spoken Component¹ (3 hours)

- any CC-CMS course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

INF – Information Literacy¹ (0 hours)

- ENGL 102

VSR – Values, Ethics, and Social Responsibility¹ (1 hour)

- CSCE 390 - *must be passed with a grade of C or higher*

¹ **Carolina Core Stand Alone or Overlay Eligible Requirements** — Overlay-approved courses offer students the option of meeting two Carolina Core components in a single course. A maximum of two overlays is allowed. The total Carolina Core credit hours for this program must add up to a minimum of 35 hours.

2. College Requirements (0 hours)

No college-required courses for this program.

3. Program Requirements (46-55 hours)**Supporting Courses (42 hours)****Foundational Courses (16 hours)**

| Course | Title | Credits |
|---------------------------|--|-----------|
| MATH 241 | Vector Calculus | 3 |
| MATH 344 | Applied Linear Algebra | 3 |
| MATH 344L | Applied Linear Algebra Lab | 1 |
| MATH 374 | Discrete Structures (must be passed with a grade of C or higher) | 3 |
| STAT 509 | Statistics for Engineers | 3 |
| ENGL 462 | Technical Writing | 3 |
| or ENGL 463 | Business Writing | |
| Total Credit Hours | | 16 |

Laboratory Science Requirement (4 hours)

| Course | Title | Credits |
|------------------------------|--|----------|
| Select one of the following: | | |
| ANTH 161 | Human Origins: An Introduction to Biological Anthropology | 4 |
| ASTR 101 | Introduction to Astronomy | |
| BIOL 101 & 101L | Biological Principles I and Biological Principles I Laboratory | |
| BIOL 110 | General Biology | |
| CHEM 111 & 111L | General Chemistry I and General Chemistry I Lab | |
| CHEM 141 | Principles of Chemistry I | |
| ENVR 101 & 101L | Introduction to the Environment and Introduction to the Environment Lab | |
| ENVR 200 | Natural History of South Carolina | |
| GEOG 201 | Landform Geography | |
| GEOG 202 | Weather and Climate | |
| GEOL 101 | Introduction to the Earth | |
| GEOL 103 | Environment of the Earth | |
| GEOL 201 | Observing the Earth | |
| GEOL 215 & 215L | Coastal Environments of the Southeastern U.S. and Coastal Environments of the Southeastern U.S. (Laboratory) | |
| GEOL 302 | Rocks and Minerals | |
| MSCI 101 | The Ocean Environment | |
| MSCI 102 | The Living Ocean | |
| MSCI 210 & 210L | Oceans and Society and Oceans and Society Laboratory | |
| MSCI 215 & 215L | Coastal Environments of the Southeastern US and Coastal Environments of the Southeastern U.S. (Laboratory) | |
| PHYS 211 & 211L | Essentials of Physics I and Essentials of Physics I Lab | |
| Total Credit Hours | | 4 |

Lower Division Computing (22 hours)

Must be passed with a grade of C or higher:

| Course | Title | Credits |
|---------------------------|---------------------------------------|-----------|
| CSCE 145 | Algorithmic Design I | 4 |
| CSCE 146 | Algorithmic Design II | 4 |
| CSCE 190 | Computing in the Modern World | 1 |
| CSCE 211 | Digital Logic Design | 3 |
| CSCE 212 | Introduction to Computer Architecture | 3 |
| CSCE 215 | UNIX/Linux Fundamentals | 1 |
| CSCE 240 | Advanced Programming Techniques | 3 |
| CSCE 247 | Software Engineering | 3 |
| Total Credit Hours | | 22 |

Electives (4-13)

At least 120 degree applicable credits are required to complete the BSCS in Computer Science. The CS curriculum includes 4-13 hours of electives depending on how students fulfill the Carolina Core requirements and their choice of Concentration. Any course in the university can be used to satisfy the elective requirement, including additional electives in the major.

4. Major Requirements (30-33 hours)

Must be passed with a grade of C or higher.

Major Courses (21 hours)

| Course | Title | Credits |
|---------------------------|-----------------------------------|-----------|
| CSCE 311 | Operating Systems | 3 |
| CSCE 330 | Programming Language Structures | 3 |
| CSCE 350 | Data Structures and Algorithms | 3 |
| CSCE 355 | Foundations of Computation | 3 |
| CSCE 416 | Introduction to Computer Networks | 3 |
| CSCE 490 | Capstone Computing Project I | 3 |
| CSCE 492 | Capstone Computing Project II | 3 |
| Total Credit Hours | | 21 |

Major Electives (9 hours)

Any CSCE course 500 or higher. Students may choose to complete a 12-hour concentration in Artificial Intelligence or Cybersecurity in place of the Major Electives.

Concentrations (12 hours)

Students may choose to complete a 12-hour concentration below in place of the 9 hours of Major Electives.

Artificial Intelligence Concentration (12 hours)

| Course | Title | Credits |
|--|---------------------------------------|---------|
| CSCE 580 | Artificial Intelligence | 3 |
| Select three courses from the following: | | 9 |
| CSCE 555 | Algorithms in Bioinformatics | |
| CSCE 567 | Visualization Tools | |
| CSCE 574 | Robotics | |
| CSCE 578 | Text Processing | |
| CSCE 582 | Bayesian Networks and Decision Graphs | |
| CSCE 585 | Machine Learning Systems | |

| | | |
|---------------------------|--------------------|-----------|
| CSCE 587 | Big Data Analytics | |
| Total Credit Hours | | 12 |

Cybersecurity Concentration (12 hours)

| Course | Title | Credits |
|---------------------------------------|-----------------------------------|-----------|
| CSCE 201 | Introduction to Computer Security | 3 |
| CSCE 522 | Information Security Principles | 3 |
| CSCE 548 | Building Secure Software | 3 |
| Select one course from the following: | | 3 |
| CSCE 520 | Database System Design | |
| CSCE 557 | Introduction to Cryptography | |
| Total Credit Hours | | 12 |

Major Map

A major map is a layout of required courses in a given program of study, including critical courses and suggested course sequences to ensure a clear path to graduation.

Major maps are only a suggested or recommended sequence of courses required in a program of study. Please contact your academic advisor for assistance in the application of specific coursework to a program of study and course selection and planning for upcoming semesters.

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