Computer Science

Computer Science

The B.S. in Computer Science (CS) degree program emphasizes analytical thinking and problem solving involving scientific applications. The degree includes the theoretical foundations of computer science in the study of algorithms, data structures, computer architecture, programming languages, and net-centric computing. Concentration areas include intelligent systems, software engineering, and cybersecurity.

Program Requirements

In addition to the university’s general requirements, students seeking the B.S. in Computer Science must meet the requirements listed below.

A minimum grade of "C-" is required for all major and major-related courses with a cumulative major GPA of 2.5 or higher. Students should consult with their academic advisor for courses which may satisfy both the General Studies requirements and common prerequisites.

Graduates of the Computer Science degree program will be known for their accomplishments in the early stages on their careers and they should:

- Develop computerized solutions to important problems either individually or through interdisciplinary teams within a global and societal context.
- Professionally and ethically engage in technical or business activity through computer science ability, communication skills and knowledge.
- Engage in continuing professional growth through post-graduate education, continuing education, or professional activity.
- Contribute to the economic development of the Northwest Florida region and the state of Florida.

Computer Science

General Education

In addition to the General Education requirements listed on this page, students must satisfy all additional University requirements, including the Gordon Rule, multicultural, and foreign language requirements. With appropriate planning and coordination with an academic advisor, students may satisfy some of the general University requirements through the General Education curriculum. For a complete listing of general degree requirements, refer to the "University Requirements" section of this catalog.

General Education Curriculum:

Communication

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC 1101</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENC 1102</td>
<td>English Composition II</td>
<td>3</td>
</tr>
</tbody>
</table>

Mathematics

Choose one course from Group A and one Additional course from either Group A or Group B

Group A

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 1105</td>
<td>College Algebra</td>
</tr>
<tr>
<td>MAC 1105C</td>
<td>College Algebra with Lab</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus I</td>
</tr>
</tbody>
</table>

Group B

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 1114</td>
<td>Trigonometry</td>
</tr>
<tr>
<td>MAC 1140</td>
<td>Precalculus Algebra</td>
</tr>
<tr>
<td>MAC 1147</td>
<td>Precalculus with Trigonometry</td>
</tr>
<tr>
<td>MAC 2233</td>
<td>Calculus with Business Applications</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus II</td>
</tr>
</tbody>
</table>

Social Sciences

Choose one course from Group A and one additional course from either Group A or Group B

Group A

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMH 2020</td>
<td>United States since 1877</td>
</tr>
<tr>
<td>ANT 2000</td>
<td>Introduction to Anthropology</td>
</tr>
<tr>
<td>ECO 2013</td>
<td>Principles of Economics Macro</td>
</tr>
<tr>
<td>POS 2041</td>
<td>American Politics</td>
</tr>
<tr>
<td>PSY 2012</td>
<td>General Psychology</td>
</tr>
<tr>
<td>SYG 2000</td>
<td>Introduction to Sociology</td>
</tr>
</tbody>
</table>

Group B

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMH 2010</td>
<td>United States to 1877</td>
</tr>
<tr>
<td>ANT 2400</td>
<td>Current Cultural Issues</td>
</tr>
<tr>
<td>ANT 2100</td>
<td>Introduction to Archaeology</td>
</tr>
<tr>
<td>CCJ 2002</td>
<td>Survey of Crime and Justice</td>
</tr>
<tr>
<td>CPO 2002</td>
<td>Comparative Politics</td>
</tr>
<tr>
<td>DEP 2004</td>
<td>Human Development Across the Lifespan</td>
</tr>
<tr>
<td>EUH 1000</td>
<td>Western Perspectives I</td>
</tr>
<tr>
<td>EUH 1001</td>
<td>Western Perspectives II</td>
</tr>
<tr>
<td>FIN 2104</td>
<td>Personal Financial Planning</td>
</tr>
<tr>
<td>GEA 2000</td>
<td>Nations and Regions of the World</td>
</tr>
<tr>
<td>GEB 1011</td>
<td>Introduction to Business</td>
</tr>
<tr>
<td>IDH 1041</td>
<td>Honors Core 2</td>
</tr>
<tr>
<td>INR 2002</td>
<td>International Politics</td>
</tr>
<tr>
<td>MMC 2000</td>
<td>Principles of Mass Communication</td>
</tr>
<tr>
<td>PLA 2013</td>
<td>Survey of American Law</td>
</tr>
<tr>
<td>SOW 2192</td>
<td>Understanding Relationships in the 21st Century</td>
</tr>
<tr>
<td>SPM 2010</td>
<td>Sport in Global Society</td>
</tr>
<tr>
<td>SYG 2010</td>
<td>Current Social Problems</td>
</tr>
</tbody>
</table>

Humanities

Choose one course from Group A and one additional course from either Group A or Group B

Group A

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARH 1000</td>
<td>Art Appreciation</td>
</tr>
<tr>
<td>LIT 2000</td>
<td>Introduction to Literature</td>
</tr>
<tr>
<td>MUL 2010</td>
<td>Music Appreciation</td>
</tr>
<tr>
<td>PHI 2010</td>
<td>Introduction to Philosophy</td>
</tr>
<tr>
<td>THE 2000</td>
<td>Theatre Appreciation</td>
</tr>
</tbody>
</table>

Group B

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AML 2010</td>
<td>American Literature I</td>
</tr>
<tr>
<td>AML 2020</td>
<td>American Literature II</td>
</tr>
</tbody>
</table>
Computer Science

AML 2072  Sex, Money, and Power in American Literature
ARH 2050  Western Survey I: Prehistory to the Medieval Period
ARH 2051  Western Survey II: Renaissance to Contemporary
ART 1015C Exploring Artistic Vision
ART 2821  Art and Visual Culture Today
CRW 2001  Introduction to Creative Writing
ENL 2010  History of English Literature I
ENL 2020  History of English Literature II
IDH 1040  Honors Core 1
LIT 2030  Introduction to Poetry
MUH 2930  The Music Experience: Special Topics
PHI 2103  Critical Thinking
PHI 2603  Ethics in Contemporary Society
REL 1300  World Religions
THE 2300  Survey of Dramatic Literature
SPC 2608  Basic Communication Skills

Natural Sciences

Choose one course from Group A and one additional course from either Group A or Group B

Group A
AST 1002  Descriptive Astronomy
BSC 1005  General Biology for Non-Majors
BSC 1085  Anatomy and Physiology I
BSC 2010  Biology I
CHM 1020  Concepts in Chemistry
CHM 2045  General Chemistry I
ESC 2000  Introduction to Earth Science
EVR 2001  Introduction to Environmental Science
PHY 2048  Calculus-Based Physics I
PHY 2048C University Physics I - Studio
PHY 2053  Algebra-Based Physics I

Group B
ANT 2511  Biological Anthropology
BOT 2010  General Botany
BSC 1050  Fundamentals of Ecology
BSC 1086  Anatomy and Physiology II
BSC 2011  Biology II
BSC 2311  Introduction to Oceanography and Marine Biology
CHM 1032  Fundamentals of General Chemistry
CHM 2046  General Chemistry II
CIS 2530  Introduction to Cybersecurity
GEO 1200  Physical Geography
GLY 2010  Physical Geology
MCB 1000  Fundamentals of Microbiology
PHC 2082  Informatics and Your Health
PHY 2049  Calculus-Based Physics II
PHY 2054  Algebra-Based Physics II

May be taken with or without lab.
** Algebra-Based Physics is usually recommended for non-science majors, while Calculus-Based Physics is recommended for science majors
*** Although students receive 5 semester hours credit for PHY 2048C, an additional 3 semester science course will be needed to meet General Education requirements.

General Education Electives

Choose an additional course from two of the three areas of Humanities, Social Sciences and Natural Sciences

The following courses are recommended to complete general education requirements:

- Humanities/Contemporary Values
  PHI 2603  Ethics in Contemporary Society 3
- Mathematics
  MAC 2311  Analytic Geometry and Calculus I 4
  MAC 2312  Analytic Geometry and Calculus II 4
- Natural Science
  PHY 2048+L  Calculus-Based Physics I (+Lab) 4
  PHY 2049+L  Calculus-Based Physics II (+Lab) 4
- Social Science: Socio-political
  ECO 2013  Principles of Economics Macro 3

Multicultural Requirement

Multicultural Courses

An important component of a liberal education is the study of cultures other than one's own. As such, multiculturalism encompasses the appreciation of the values, expressions, and modes of organization of diverse cultural communities. To further such study, the University of West Florida requires all students pursuing a bachelor's degree to complete at least one course that explores one or more of the dimensions of another culture (language, religion, socio-economic structures, etc.). Students are exempt from this requirement if they have completed an A.A. degree, the general education program at a Florida public institution, or a baccalaureate degree.

The requirement is satisfied by the successful completion of a multicultural course designated on the following list. Several of the selections are General Education courses, and students may enroll in these to meet both the General Education and the multicultural requirements.

**Passed by UWF Faculty Senate on 11/08/2002

This list is continually updated and students are encouraged to check with their advisors for alternative options.

AML 2010  American Literature I 3
AML 2020  American Literature II 3
AML 3604  African American Literature 3
AML 3624  Black Women Writers 3
AML 4015  Topics in Nineteenth-Century American Literature 3
ANT 2000  Introduction to Anthropology 3
ANT 2301  Human Sexuality and Culture 3
ANT 3212  Peoples and Cultures of the World 3
ANT 3312  North American Indians 3
ANT 3363  Japanese Culture 3
ANT 3403 Cultural Ecology 3
ANT 4006 Anthropology of Human Rights 3
ARH 1000 Art Appreciation 3
ARH 2050 Western Survey I: Prehistory to the Medieval Period 3
ARH 2051 Western Survey II: Renaissance to Contemporary 3
ARH 3590 Non-Western Art 3
ARH 3606 Native American Art 3
ARH 4302 Late Renaissance Art in Italy 3
ARH 4305 Early Italian Renaissance Art 3
ARH 4412 The Age of Revolution to Romanticism in Europe: 1750-1850 3
ARH 4450 Modern Art: 1850-1980 3
ARH 4470 Contemporary Art 3
ARH 4563 Art of Japan 3
ARH 4892 Inscribed Bodies: Concepts of Tattoo and Body Art in World History 3
CCJ 3678 Race, Gender, Ethnicity, and Crime 3
COM 3014 Gender Communication 3
COM 3461 Intercultural Communication 3
CPO 2002 Comparative Politics 3
CPO 3103 Politics of Western Europe 3
CPO 4303 Politics of Spain, Portugal, and Latin America 3
CPO 4792 Geopolitics 3
CRW 2001 Introduction to Creative Writing 3
EDF 2085 Teaching Diverse Populations 3
ENG 4013 Introduction to Literary Theory 3
ENL 2020 History of English Literature II 3
EUH 1000 Western Perspectives I 3
EUH 1001 Western Perspectives II 3
EUH 3203 Modern Europe 3
EUH 3411 Rome and the Mediterranean World 3
EUH 3576 Soviet Union since 1917 3
FRE 4955 Supervised Foreign Language Field Experience Abroad 1-3
GEO 2000 Nations and Regions of the World 3
GEO 4405 Geography of Latin America 3
GEO 4361 International Business 3
GEO 3421 Cultural Geography 3
GEO 3471 Geography of World Affairs 3
HIS 4316 Women in the Atlantic World 3
IDH 1040 Honors Core 1 3
IDH 1041 Honors Core 2 3
INR 2002 International Politics 3
LAH 4728 Gender and Sexuality in Latin America from Colonization to Today 3
JPN 3270 Supervised Language Experience Abroad 3
LIT 2000 Introduction to Literature 3
LIT 2030 Introduction to Poetry 3
LIT 3233 Postcolonial Literature 3
LIT 4385 Feminist Theory 3
MAN 4102 Management of Diversity 3
MAR 4156 Seminar in International Marketing 3
MMC 3601 Minorities and the Mass Media 3
MMC 4300 Global Communication 3
MUH 2930 The Music Experience: Special Topics 3
MUL 2010 Music Appreciation 3
NUR 4615 Community and Public Health Nursing 3
NUR 4636 Public Health & Community-based Nursing 3
PHI 3790 African Philosophy 3
PSY 3680 Positive Psychology 3
REL 3142 New Perspectives on the Religious Self 3
REL 3310 Philosophies of the East 3
SOP 3730 Psychology, Culture, and Society 3
SOW 4233 Human Diversity and Social Justice 3
SOW 4941 Immersive Experiences in Social Work 3
SPN 3400 Advanced Stylistics 3
SPN 4500 Spanish Civilization 3
SPN 4520 Latin American Culture and Civilization 3
SYO 4530 Inequality in America 3

Civic Literacy Requirement

1. Baccalaureate degree-seeking students initially entering a state university fall semester 2018 and thereafter must demonstrate competency in civic literacy through one of the following options prior to graduation:
   a. Successfully passing either POSX041 American Government or AMHX020 Introductory Survey Since 1877. Each of the courses must include the following competencies:
      i. Understanding of the basic principles and practices of American democracy and how they are applied in our republican form of government;
      ii. An understanding of the United States Constitution and its application;
      iii. Knowledge of the founding documents and how they have shaped the nature and functions of our institutions of self-government; and
      iv. An understanding of landmark Supreme Court cases, landmark legislation and landmark executive actions and their impact on law and society.

2. Achieving the standard score on one of the following assessments:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Standard Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civic Literacy Exam</td>
<td>60</td>
</tr>
<tr>
<td>Advanced Placement Government</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Placement United States</td>
<td>4</td>
</tr>
<tr>
<td>CLEP American Government</td>
<td>50</td>
</tr>
</tbody>
</table>

*BOG 8.006*

Common Prerequisites

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. See the Common Prerequisite Manual for course substitutions from Florida colleges and universities.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COP XXXX</td>
<td>Introductory programming in C, C++, Java, or equivalent language</td>
<td>3</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus I **</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus II ***</td>
<td>4</td>
</tr>
<tr>
<td>PHY 2048</td>
<td>Calculus-Based Physics I (+Lab) **</td>
<td>4</td>
</tr>
<tr>
<td>PHY 2049</td>
<td>Calculus-Based Physics II (+Lab) *</td>
<td>4</td>
</tr>
</tbody>
</table>

Two science courses for science majors, please choose from the list below

- ANT 2511 Biological Anthropology
- AST 1002 Descriptive Astronomy
- BOT 2010 General Botany
- BSC 1050 Fundamentals of Ecology
- BSC 1085 Anatomy and Physiology I
- BSC 1086 Anatomy and Physiology II
- BSC 2010 Biology I
- BSC 2011 Biology II
- BSC 2311 Introduction to Oceanography and Marine Biology
- CHM 1032 Fundamentals of General Chemistry
- CHM 2045 General Chemistry I
- CHM 2046 General Chemistry II
- ESC 2000 Introduction to Earth Science
- EVR 2001 Introduction to Environmental Science
- GEO 1200 Physical Geography
- GLY 2010 Physical Geology
- MCB 1000 Fundamentals of Microbiology

** Total Hours: 25

* Indicates common prerequisites which can be used to satisfy General Education requirements.
** A minimum grade of C is required for MAC2311, MAC2312 and PHY2048/L.
† A minimum grade of C- is required for COP XXXX

### Lower Division Electives

Students must complete sufficient 1000/2000 level electives to satisfy at least 57 sh in the lower division. Current UWF students may use elective courses at any level (1000-4000) to meet this elective requirement.

** Total Hours: 0-12

** Major**

- CDA 3101 Introduction to Computer Organization * | 3
- COT 3100 Discrete Structures * | 3
- CEN 3031 Software Engineering I * | 3
- CIS 4592 Capstone Project * | 3
- COP 4710 Database Systems * | 3
- COP 3014 Algorithm and Program Design * | 3
- COP 3530 Data Structures and Algorithms I * | 3
- COP 4534 Data Structures and Algorithms II * | 3
- COP 3022 Intermediate Computer Programming * | 3
- COP 4027 Advanced Computer Programming * | 3
- COP 4020 Programming Languages * | 3
- COP 4634 Systems & Networks I * | 3
- COP 4635 Systems & Networks II * | 3

** COT 4420 Theory of Computation * | 3

Choose one group of courses from the following groupings

** Intelligent Systems:**

- CAP 4601 Introduction to Artificial Intelligence * | 3
- CAP 4786 Introduction to Big Data Analytics * | 3

** Software Engineering:**

- CEN 3032 Software Engineering II * | 3
- CEN 4053 Software Engineering Management * | 3

** or **

** Cybersecurity:**

- CEN 4078 Secure Software Development * | 3
- CNT 4403 Computer and Network Security * | 3

List of pre-approved elective courses available in the department * * | 6

** Total Hours: 54

* Courses included in the major GPA

### Major-Related

Choose one course from the following course list:

- MAS 3105 Linear Algebra | 3
- MHF 3202 Set Theory and Mathematical Logic | 3
- STA 4321 Introduction to Mathematical Statistics I | 3

** Total Hours: 6

* Two courses must be selected from Computer Science approved upper-level electives. Students should consult with the CS academic advisor, or their assigned CS faculty advisor, for selecting the upper-level Computer Science electives.

### Computer Science Minor

The Computer Science Minor provides students with knowledge of basic software aspects of computer systems. Fundamentals of programming experience utilizing procedural and object-oriented paradigms prepare students in this minor for software development on a variety of computing platforms. Computer Science, CIS, Software Engineering, Cybersecurity, and Software Design & Development majors may not earn this minor.

** COT 3100 Discrete Structures | 3
- CDA 3101 Introduction to Computer Organization | 3
- COP 3014 Algorithm and Program Design | 3
- COP 3530 Data Structures and Algorithms I | 3

Choose one of the following:

- COP 4634 Systems & Networks I | 3
- COP 4331 Object Oriented Programming | 3
- COP 4534 Data Structures and Algorithms II | 3
- COT 4420 Theory of Computation | 3
- EEL 3701 Digital Logic and Computer Systems | 3

** Total Hours: 15