

# Bachelor of Science in Computer Science

The Bachelor of Science (BS) in Computer Science (CS) at the University of Alaska Anchorage teaches students the fundamental principles of computer science and topical issues in computing so they may pursue advanced degrees or enter the workplace as productive, competent software development or information technology professionals. The program seeks to further the profession of computer science through professional activities and public service within the local community and beyond. Faculty engage in and disseminate research to advance the development of computer science and provide innovative technological solutions to address the needs of modern society.

The BS in Computer Science is accredited by the Computing Accreditation Commission of ABET, <https://www.abet.org> (<https://www.abet.org/>).

## Admission Requirements

Complete the Admission Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/>).

## Special Considerations

- Students who intend to enroll in this degree of study are strongly encouraged to complete the following content in high school with a grade of C or better: Trigonometry (1/2 year), Physics (1 year), Algebra (2 years), Chemistry (1 year), and English (3 years). Insufficient preparation may increase the number of semesters required to complete the degree.
- A student who is unable to earn a minimum grade of C in any course offered by the College of Engineering may retake that course up to two additional times. A student who fails to earn a minimum grade of C on the second attempt will be required to meet with an academic advisor and a member of the College of Engineering professional advising staff to develop a plan for improvement of academic performance before continuing in the program. Failure to earn a minimum grade of C on the third attempt will result in removal from the program. Re-admittance requires a letter of appeal from the student with an explanation of any mitigating factors and how these factors have been addressed. Re-admittance is subject to approval by the department chair of the program.

## Graduation Requirements

- Complete the General University Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/>).
- Complete the General Education Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/gers/>).

- The 3 credit Tier 1 Quantitative Skills GER will be met and exceeded by the following degree requirements: MATH A251, MATH A251F, MATH A252, or MATH A252F.
- For 3 credits of Tier 2 Humanities, choose PHIL A305.
- The 7 credit Natural Science GER will be met and exceeded by the following degree requirements: (PHYS A123 & PHYS A123L) OR (PHYS A211 & PHYS A211L), and (PHYS A124 & PHYS A124L) OR (PHYS A212 & PHYS A212L).
- All computer science majors must take a standardized test of knowledge of computer science approved by the CS faculty for the purpose of evaluating program effectiveness. There is no minimum score required for graduation. This test will normally be taken during the senior year.
- Complete the following major requirements with a minimum grade of C in all CSCE, MATH and STAT courses.

Code	Title	Credits
<b>Core Courses</b>		
CSCE A101	Introduction to Computer Science	3
CSCE A201	Computer Programming I	4
CSCE A211	Computer Programming II	4
CSCE/EE A241	Computer Hardware Concepts	4
CSCE A248	Computer Organization and Assembly Language Programming	3
CSCE A311	Data Structures and Algorithms	3
CSCE A321	Operating Systems	3
CSCE A331	Programming Language Concepts	3
CSCE A351	Automata, Algorithms and Complexity	3
CSCE A360	Database Systems	3
CSCE A365	Computer Networks	3
CSCE A401	Software Engineering	3
CSCE A465	Computer and Network Security	3
CSCE A470	Computer Science and Engineering Capstone Project	3
<b>Required Support Courses</b>		
MATH A251 or MATH A251F	Calculus I F.A.T. Calculus I	4-6
MATH A252 or MATH A252F	Calculus II F.A.T. Calculus II	4-6
MATH A261	Introduction to Discrete Mathematics	3
PHYS A123 & A123L or PHYS A211 & A211L	College Physics I and College Physics I Laboratory General Physics I and General Physics I Laboratory	4
PHYS A124 & A124L or PHYS A212 & A212L	College Physics II and College Physics II Laboratory General Physics II and General Physics II Laboratory	4
STAT A307	Probability and Statistics	4

ENGL A313	Professional Writing	3
or ENGL A414	Research Writing	
or ENGL A478	Public Science Writing	
PHIL A305	Professional Ethics	3
Upper-Division Courses <sup>1</sup>		12
<b>Total</b>		<b>86-90</b>

<sup>1</sup> Complete an additional 12 upper-division credits in CSCE, MATH (excluding MATH A420 and MATH A495A), or STAT. Nine of these credits must be in CSCE courses. A maximum of 3 credits of CSCE A395, a maximum of 3 credits of CSCE A495, and maximum of 6 credits of CSCE A498 may be applied to degree requirements.

**A minimum of 120 credits is required for the degree, of which 39 credits must be upper-division.**

## Honors in Computer Science

The Bachelor of Science in Computer Science recognizes distinguished achievement by conferring programmatic honors in computer science. In order to receive honors in computer science, a student must meet the following requirements:

- Meet the requirements for Graduation with Honors (<http://catalog.uaa.alaska.edu/academicpoliciesprocesses/academicstandardsregulations/graduation/>);
- Meet the requirements for a Bachelor of Science in Computer Science;
- Earn a minimum GPA of 3.50 in the major requirements.

## Program Student Learning Outcomes

Students graduating with a Bachelor of Science in Computer Science will be able 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, including technical and non-technical audiences for business, end-user, client, and computing 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.

## Sample Plan

The academic plan below is one pathway through the degree/certificate. It includes all requirements, taking into account recommendations from program faculty. Each student's plan may vary according to their initial course placement (<http://catalog.uaa.alaska.edu/>

academicpoliciesprocesses/academicstandardsregulations/courseplacement/), intended course load, additional majors and/or minors, and their placement into required prerequisite courses. Any change in the plan below can have an unforeseen impact on the rest of the plan. **Therefore, it is very important to meet with your academic advisor to verify your personal academic plan.**

**Please review the following terms, definitions, and resources associated with the sample academic plan below.**

- Each course in the far left column links to a pop-up bubble with a course description, prerequisite requirements, and associations with university requirements. For example, if a course fulfills a general education requirement, you will see that in the pop-up bubble.
- **GER:** indicates a General Education Requirement (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/gers/>). GERs that also count toward degree/certificate requirements appear as a specific course in the plan. For these courses, "GER" is not indicated explicitly in the table, but if you click on the course, you will see the course's GER status in the pop-up bubble.
- **Program Elective:** indicates a specific course selection determined by program faculty to fulfill a degree/certificate requirement. Students should seek assistance from their academic advisor.
- **Elective:** indicates an open selection of 100-400 level university courses to fulfill elective credits needed to meet the minimum total credits toward the degree/certificate.
- **Upper Division Program Elective:** indicates a specific 300-400 level course selection determined by the program faculty to fulfill a degree/certificate requirement. Students should seek assistance from their academic advisor.
- **Upper Division Elective:** indicates an open selection of 300-400 level courses to fulfill elective credits needed to meet the minimum total credits toward the degree/certificate. These courses must be upper division in order to meet General University Requirements for the particular degree/certificate type.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CSCE A101	Introduction to Computer Science	3
MATH A251	Calculus I <sup>1</sup>	4-6
or	or F.A.T. Calculus I	
MATH A251F		
WRTG A111	Writing Across Contexts	3
GER Fine Arts		3
GER Oral Communication Skills		3
<b>Credits</b>		<b>16-18</b>
<b>Spring</b>		
CSCE A201	Computer Programming I	4
MATH A252	Calculus II	4-6
or	or F.A.T. Calculus II	
MATH A252F		
GER Natural Sciences w/ Lab		4

GER Written Communication Skills (200-level)	3
<b>Credits</b>	<b>15-17</b>

**Second Year****Fall**

CSCE A211	Computer Programming II	4
CSCE A241	Computer Hardware Concepts	4
MATH A261	Introduction to Discrete Mathematics	3
PHYS A123 & A123L	College Physics I and College Physics I Laboratory	4
<b>Credits</b>		<b>15</b>

**Spring**

CSCE A248	Computer Organization and Assembly Language Programming	3
CSCE A311	Data Structures and Algorithms	3
CSCE A360	Database Systems	3
PHYS A124 & A124L	College Physics II and College Physics II Laboratory	4
Elective		3
<b>Credits</b>		<b>16</b>

**Third Year****Fall**

CSCE A351	Automata, Algorithms and Complexity	3
CSCE A365	Computer Networks	3
STAT A307	Probability and Statistics	4
GER Natural Sciences		3
GER Social Sciences		3
<b>Credits</b>		<b>16</b>

**Spring**

CSCE A321	Operating Systems	3
CSCE A331	Programming Language Concepts	3
ENGL A313	Professional Writing	3
or	or Research Writing	
ENGL A414	or Public Science Writing	
or		
ENGL A478		
GER Social Sciences <sup>2</sup>		3
Elective		3
<b>Credits</b>		<b>15</b>

**Fourth Year****Fall**

CSCE A401	Software Engineering	3
GER Humanities		3
Upper Division Program Elective		3
Upper Division Program Elective		3
Upper Division Program Elective		3
<b>Credits</b>		<b>15</b>

**Spring**

CSCE A465	Computer and Network Security	3
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CSCE A470	Computer Science and Engineering Capstone Project	3
PHIL A305	Professional Ethics	3
Upper Division Program Elective		3
<b>Credits</b>		<b>12</b>
<b>Total Credits</b>		<b>120-124</b>

<sup>1</sup> MATH A251 or MATH A251F have prerequisites.

<sup>2</sup> Choose a course that also fulfills the Alaska Native-Themed GER.