Computer Science

College of Natural Science and Mathematics
Department of Computer Science
907-474-2777
www.cs.uaf.edu

B.S., B.S./M.S. Degrees

Minimum Requirements for Degrees: B.S.: 120 credits;
B.S./M.S.: 141 credits

Computer science is the study of information handling and its application to the problems of the world. Computing is widely used in support of science, engineering, business, law, medicine, education and the social sciences. The employment potential for computer science graduates is one of the highest of all majors in the College of Natural Science and Mathematics.

The B.S. and M.S. degrees follow the recommendations of the Association for Computing Machinery (ACM) and the Institute for Electrical and Electronic Engineers (IEEE). The B.S. degree is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

The computer science undergraduate program introduces the fundamentals of computer programming, hardware and theory. It emphasizes the application of general principles to real-world problems. Mathematics and engineering play critical roles in the core. A solid background in fundamentals enables graduates to understand the uses of today's computers and to participate in future developments.

Major — B.S. Degree

1. Complete the general university requirements. (See page 131. As part of the core curriculum requirements, complete: MATH F200X* and any approved ethics course.)
2. Complete the B.S. degree requirements. (See page 136. As part of the B.S. degree requirements, complete: MATH F201X*, PHYS F211X* and PHYS F212X*.)
3. Complete the following:*
   MATH F307—Discrete Mathematics 3
   STAT F300—Statistics 3
4. Complete one of the following:*
   MATH F302—Differential Equations 3
   MATH F308W—Abstract Algebra 3
   MATH F310—Numerical Analysis 3
   MATH F314—Linear Algebra 3
   MATH F371—Probability 3
   MATH F408—Mathematical Statistics 3
   MATH F460—Mathematical Modeling 3
5. Complete the following program (major) requirements:*
   CS F201—Computer Science I 3
   CS F202—Computer Science II 3
   CS F301—Assembly Language Programming 3
   CS F311—Data Structures and Algorithms 3
   CS F321—Operating System 3
   CS F331—Programming Languages 3
   CS F411—Analysis of Algorithms (3)
   or CS F451—Automata and Formal Languages (3) 3
   CS F441—Systems Architecture (3)
   or EE F443—Computer Engineering (4) ..... 3 – 4
   CS F471W—Software Engineering 3
   CS F472W,O—Senior Project and Professional Practice 3
   EE F341—Digital and Computer Analysis and Design 4
   ENGL F314W,O/2—Technical Writing 3
   Electives in computer science at the F300- or F400-level
   or approved electives (such as EE F443) 9
6. Minimum credits required 120

* *Student must earn a C grade or better in each course.*

Major — B.S./M.S. Degree

1. Complete the following admission requirements:
   a. CS major (junior preferred) or senior standing.
   b. GPA 3.25 or above based on a minimum of 24 credits. Students must maintain a cumulative GPA of 3.0 to remain in the program.
   c. Submit GRE (general) scores.
   d. Submit a study goal statement.
   e. Submit a UAF graduate application for admission.
2. Complete the general university requirements. (See page 131. As part of the core curriculum requirements, complete: MATH F200X* and any approved ethics course.)
3. Complete the B.S. degree requirements. (See page 136. As part of the B.S. degree requirements, complete: MATH F201X*, PHYS F211X* and PHYS F212X*.)
4. Complete the following program (major) requirements:*
   CS F201—Computer Science I 3
   CS F202—Computer Science II 3
   CS F301—Assembly Language Programming 3
   CS F311—Data Structures and Algorithms 3
   CS F321—Operating System 3
   CS F331—Programming Languages 3
   CS F441—Systems Architecture 3
   CS F471W—Software Engineering 3
   CS F472W,O—Senior Project and Professional Practice 3
   EE F341—Digital and Computer Analysis and Design 4
   ENGL F314W,O/2—Technical Writing 3
   MATH elective at F300/F400-level 3
   MATH F307—Discrete Mathematics 3
   STAT F300—Statistics 3

5. Complete the following master core courses:
   CS F611—Complexity of Algorithms.....3
   CS F631—Programming Language Implementation.....3
   CS F641—Advanced Systems Architecture.....3
   CS F671—Advanced Software Engineering.....3
   CS F690—Graduate Seminar and Project.....3
   CS F691—Graduate Seminar and Project.....3
   CS upper-division/graduate level electives.....3
   CS graduate level electives.....6
6. Pass a written comprehensive exam in the areas of computer algorithms/theory/complexity, computer architecture, computer language and software engineering.
7. Minimum credits required for both degrees.....141

* *Student must earn a C grade or better in each course required for the B.S. degree.*

Note: For the master's degree, a student must earn an A or B grade in F400-level courses. The C grade will be accepted in 600-level courses provided a B grade point average is maintained.

Note: This degree program must be completed in seven years or the student will be disqualified from the program. If a student is disqualified, a B.S. in computer science will be awarded if: 1) completed in 10 years, and 2) the student meets the B.S. degree requirements for computer science with the option of substituting CS F411/F451 for CS F611/F651.

Minor

1. Complete the following minor requirements:*
   CS F201—Computer Science I.....3
   CS F202—Computer Science II.....3
   Three electives at the F300- or F400-level from CS, EE F341, MATH F310, MATH F460; or electives approved by a computer science advisor.....9
2. Minimum credits required.....15

* *Student must earn a grade of C or better in each course used to fulfill the minor requirements.*

Note: Courses completed to satisfy this minor can be used to simultaneously satisfy other major or general distribution requirements.

All degrees (e.g. B.A., B.S., etc.) require additional courses. Refer to specific degree and program requirements.

Baccalaureate Core Requirements

COMMUNICATION (9)

Complete the following:
ENGL F111X .....(3) _____
ENGL F190H may be substituted.

Complete one of the following:
ENGL F211X **OR** ENGL F213X .....(3) _____

Complete one of the following:
COMM F131X **OR** COMM F141X .....(3) _____

PERSPECTIVES ON THE HUMAN CONDITION (18)

Complete all of the following four courses:
ANTH F100X/SOC F100X .....(3) _____
ECON F100X **OR** PS F100X .....(3) _____
HIST F100X.....(3) _____
ENGL/FL F200X .....(3) _____

Complete one of the following three courses:
ART/MUS/THR F200X, HUM F201X **OR** ANS F202X .... (3) _____

Complete one of the following six courses:
BA F323X, COMM F300X, JUST F300X, NRM F303X,
PS F300X **OR** PHIL F322X .....(3) _____

OR complete 12 credits from the above courses PLUS
- two semester-length courses in a single Alaska Native language or other non-English language **OR**
- three semester-length courses (9 credits) in American Sign Language taken at the university level.

MATHEMATICS (3)

Complete one of the following:
MATH F103X, MATH F107X, MATH F161X **OR**
STAT F200X .....(3 – 4) _____
** No credit may be earned for more than one of MATH F107X or F161X.*

OR complete one of the following:*
MATH F200X, MATH F201X, MATH F202X,
MATH F262X **OR** MATH F272X.....(4) _____
**Or any math course having one of these as a prerequisite.*

NATURAL SCIENCES (8)

Complete any two (4-credit) courses:
ATM F101X.....(4) _____
BIOL F100X .....(4) _____
BIOL F103X .....(4) _____
BIOL F104X .....(4) _____
BIOL F111X .....(4) _____
BIOL F112X .....(4) _____
BIOL F115X .....(4) _____
BIOL F116X .....(4) _____
CHEM F100X.....(4) _____
CHEM F103X.....(4) _____
CHEM F104X.....(4) _____
CHEM F105X.....(4) _____
CHEM F106X.....(4) _____
GEOG F111X.....(4) _____
GEOS F100X.....(4) _____
GEOS F101X.....(4) _____
GEOS F112X.....(4) _____
GEOS F120X.....(4) _____
GEOS F125X.....(4) _____
MSL F111X.....(4) _____
PHYS F102X.....(4) _____
PHYS F103X.....(4) _____
PHYS F104X.....(4) _____
PHYS F115X.....(4) _____
PHYS F116X.....(4) _____
PHYS F175X.....(4) _____
PHYS F211X.....(4) _____
PHYS F212X.....(4) _____
PHYS F213X.....(4) _____

LIBRARY AND INFORMATION RESEARCH (0 – 1)
Successful completion of library skills competency test **OR**
LS F100X or F101X prior to junior standing.....(0 – 1) _____

UPPER-DIVISION WRITING AND ORAL COMMUNICATION (0)

Complete the following:
Two writing intensive courses designated (W) .....(0) _____
and one oral communication intensive course
designated (O).....(0) _____
OR two oral communication intensive courses designated (O/2), at the upper-division level (see degree and/or major requirements).....(0) _____

CORE CREDITS REQUIRED ..... 38 – 39

Minimum credits required for degree 120

UNIVERSITY OF ALASKA FAIRBANKS
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