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 116. As part of the core curriculum requirements, complete: MATH 200X* and any approved ethics course.)
2. Complete the B.S. degree requirements. (See page 121. As part of the B.S. degree requirements, complete: MATH 201X*, PHYS 211X and PHYS 212X.)
3. Complete the following:*
   - MATH 307—Discrete Mathematics 3
   - STAT 300—Statistics 3
4. Complete one of the following:*
   - MATH 302—Differential Equations 3
   - MATH 308W—Abstract Algebra 3
   - MATH 310—Numerical Analysis 3
   - MATH 314—Linear Algebra 3
   - MATH 371—Probability 3
   - MATH 408—Mathematical Statistics 3
   - MATH 460—Mathematical Modeling 3
5. Complete the following program (major) requirements:*
   - CS 201—Computer Science I 3
   - CS 202—Computer Science II 3
   - CS 301—Assembly Language Programming 3
   - CS 311—Data Structures and Algorithms 3
   - CS 321—Operating System 3
   - CS 331—Programming Languages 3
   - CS 402W,O—Senior Project and Professional Practice 3
   - CS 411—Analysis of Algorithms (3) or CS 451—Automata and Formal Languages (3) 3
   - CS 441—Systems Architecture (3) or EE 443—Computer Engineering (4) 3–4
   - CS 471W—Software Engineering 3
   - EE 341—Digital and Computer Analysis and Design 4
   - ENGL 314W,O/2—Technical Writing 3
   - Electives in computer science at the 300- or 400-level or approved electives (such as EE 443) 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 116. As part of the core curriculum requirements, complete: MATH 200X* and any approved ethics course.)
3. Complete the B.S. degree requirements. (See page 121. As part of the B.S. degree requirements, complete: MATH 201X*, PHYS 211X and PHYS 212X.)
4. Complete the following program (major) requirements:*
   - CS 201—Computer Science I 3
   - CS 202—Computer Science II 3
   - CS 301—Assembly Language Programming 3
   - CS 311—Data Structures and Algorithms 3
   - CS 321—Operating System 3
   - CS 331—Programming Languages 3
   - CS 402W,O—Senior Project and Professional Practice 3
   - CS 441—Systems Architecture 3
   - CS 471W—Software Engineering
   - EE 341—Digital and Computer Analysis and Design 4
   - ENGL 314W,O/2—Technical Writing 3
   - MATH elective at 300/400-level 3
   - MATH 307—Discrete Mathematics 3
   - STAT 300—Statistics 3
5. Complete the following master core courses:
   - CS 611—Complexity of Algorithms 3
   - CS 631—Programming Language Implementation 3
   - CS 641—Advanced Systems Architecture 3
   - CS 671—Advanced Software Engineering 3
   - CS 690—Graduate Seminar and Project 3
   - CS 691—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 400-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) student meets the B.S. degree requirements for computer science with the option of substituting CS 411/451 for CS 611/651.

Minor

1. Complete the following minor requirements:*
   - CS 201—Computer Science I 3
   - CS 202—Computer Science II 3
   - Three electives at the 300- or 400-level from CS, EE 341, MATH 310, MATH 460; 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.

Baccalaureate Core Requirements

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

COMMUNICATION (9)

Complete the following:
ENGL 111X ..... (3) _____
ENGL 190H may be substituted.

Complete one of the following:
ENGL 211X **OR** ENGL 213X ..... (3) _____

Complete one of the following:
COMM 131X **OR** COMM 141X ..... (3) _____

PERSPECTIVES ON THE HUMAN CONDITION (18)

Complete all of the following four courses:
ANTH 100X/SOC 100X ..... (3) _____
ECON 100X **OR** PS 100X ..... (3) _____
HIST 100X ..... (3) _____
ENGL/FL 200X ..... (3) _____

Complete one of the following three courses:
ART/MUS/THR 200X, HUM 201X **OR** ANS 202X ..... (3) _____

Complete one of the following six courses:
BA 323X, COMM 300X, JUST 300X, NRM 303X,
PS 300X **OR** PHIL 322X ..... (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 103X, MATH 107X, MATH 161X **OR** STAT 200X ..... (3-4) _____
** No credit may be earned for more than one of MATH 107X or 161X.*

OR complete one of the following:*
MATH 200X, MATH 201X, MATH 202X,
MATH 262X **OR** MATH 272X ..... (4) _____
**Or any math course having one of these as a prerequisite*

NATURAL SCIENCES (8)

Complete any two (4-credit) courses:
ATM 101X ..... (4) _____
BIOL 100X ..... (4) _____
BIOL 103X ..... (4) _____
BIOL 104X ..... (4) _____
BIOL 105X ..... (4) _____
BIOL 106X ..... (4) _____
BIOL 111X ..... (4) _____
BIOL 112X ..... (4) _____
CHEM 100X ..... (4) _____
CHEM 103X ..... (4) _____
CHEM 104X ..... (4) _____
CHEM 105X ..... (4) _____
CHEM 106X ..... (4) _____
GEOG 205X ..... (4) _____
GEOS 100X ..... (4) _____
GEOS 101X ..... (4) _____
GEOS 112X ..... (4) _____
GEOS 120X ..... (4) _____
GEOS 125X ..... (4) _____
MSL 111X ..... (4) _____
PHYS 102X ..... (4) _____
PHYS 103X ..... (4) _____
PHYS 104X ..... (4) _____
PHYS 115X ..... (4) _____
PHYS 116X ..... (4) _____
PHYS 175X ..... (4) _____
PHYS 211X ..... (4) _____
PHYS 212X ..... (4) _____
PHYS 213X ..... (4) _____

LIBRARY AND INFORMATION RESEARCH (0–1)
Successful completion of library skills competency test **OR**
LS 100X or 101X prior to junior standing ..... (0–1) _____

UPPER-DIVISION WRITING AND ORAL COMMUNICATION (0)

Complete the following:
Two writing intensive courses designated (W) ..... (0) _____
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) _____

TOTAL CREDITS REQUIRED 38–39

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