Computer Science

College of Science, Engineering and Mathematics
Department of Mathematical Sciences
(907) 474-7332
www.cs.uaf.edu/
Degrees: B.S., B.S./M.S., M.S.
Minimum Requirements for Degrees: B.S.: 120 credits;
B.S./M.S.: 141 credits, M.S.: 30 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 activities in science, engineering, business, law, medicine, education and the social sciences.

The potential for employment is one of the highest in the entire range of subjects spanned by the College of Science, Engineering 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, theory and applications. Mathematics and engineering play critical roles in the core. Problem solving and applications of general principles to real-world problems are emphasized. A solid background in fundamentals enables the graduate to understand today's computers and their uses, and to understand and participate in future developments.

The computer science graduate program follows the recommendations of the ACM and IEEE. This program provides breadth and depth in coursework and culminates with a major unifying project. This program is available to students who have completed a B.S. degree in computer science at most institutions. Students from other universities who have completed a substantiative portion of a bachelor's level computer science program may be admitted to the M.S. program. In such cases, undergraduate courses may be required to remedy deficiencies.

For admission to the M.S. computer science program, the GRE general and computer science subject exam is required. For teaching assistantship consideration, foreign applicants whose native language is not English must submit a TOEFL score of at least 600. The department gives preference to applicants who also submit results of the Test of Spoken English (ESE).

UNDERGRADUATE PROGRAM

MAJOR
Computer Science—B.S. Degree

1. Complete the general university requirements (page 28). (As part of the core curriculum requirements, complete: MATH 200X* and any approved ethics course.)
2. Complete the B.S. degree requirements (page 34). (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 1 of the following:*
   - MATH 302—Differential Equations 3
   - MATH 308—Abstract Algebra 3
   - MATH 310—Numerical Analysis 3
   - MATH 314—Linear Algebra 3
   - MATH 371—Probability 3
   - MATH 408—Mathematical Statistics 3
   - MATH 460W,O—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—Computer 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.

Computer Science—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. GRE (general).
   d. Study goal statement.
   e. Submit a UAF graduate application for admission.
2. Complete the general university requirements (page 28). (As part of the core curriculum requirements, complete: MATH 200X* and any approved ethics course.)
3. Complete the B.S. degree requirements (page 34). (As part of the B.S. degree requirements, complete: MATH 201X*, PHYS 211X and PHYS 212X.)

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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—Computer 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) meet the B.S. degree requirements for Computer Science with option substituting CS 411/451 with CS 611/651.

MINOR
1. Complete the following:
   CS 201—Computer Science I 3
   CS 202—Computer Science II 3
   Three electives at the 300- or 400-level from CS, EE 341, AIS 310,
       MATH 310, MATH 460; or electives approved by a computer science
       advisor 9
2. Minimum credits required 15

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

GRADUATE PROGRAM
Computer Science—M.S. Degree
1. Complete the UAF admission process including the following:
a. Submit GRE general and computer science subject exam scores.
b. For teaching assistantship consideration, foreign applicants whose native language is not English must submit a TOEFL score of at least 600.
c. The department gives preference to applicants who also submit results of the Test of Spoken English (TSE).
2. Complete the general university requirements (page 43).
3. Complete the master's degree requirements (page 46).
4. Complete the following:
   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
   Approved electives 12
5. Minimum credits required 30

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