Computer Science

College of Science, Engineering and Mathematics
Department of Mathematical Sciences
(907) 474-7332
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 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 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 (page 106. As part of the core curriculum requirements, complete: MATH 200X* and any approved ethics course.)

2. Complete the B.S. degree requirements (page 112. 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.*

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. GRE (general).
   d. Study goal statement.
   e. Submit a UAF graduate application for admission.

2. Complete the general university requirements (page 106. As part of the core curriculum requirements, complete: MATH 200X* and any approved ethics course.)

3. Complete the B.S. degree requirements (page 112. 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—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.

Note: Page numbers refer to the UAF 2004-2005 academic catalog, which can be viewed online at www.uaf.edu/catalog/.

General University Requirements

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

COMMUNICATIONS (9)
Complete the following:
ENGL 111X.....(3) _____
ENGL 211X **OR** 213X.....(3) _____
COMM 131X **OR** 141X.....(3) _____

LIBRARY & INFORMATION SKILLS (0–1)
Complete the following:
LS 100X **OR** 101X ..... (0-1) _____
OR Successful completion of library skills competency test.

PERSPECTIVES ON THE HUMAN CONDITION (18)
Complete either the following six courses:
ANTH 100X **OR** SOC 100X .....(3) _____
ECON/PS 100X .....(3) _____
HIST 100X.....(3) _____
ART/MUS/THR 200X, HUM 201X **OR** ANS 202X.....(3) _____
ENGL/FL 200X .....(3) _____
PHIL 322X, NRM 303X, COMM 300X,
PS 300X **OR** JUST 300X.....(3) _____
OR Complete 12 cr from the above list **PLUS** two semester-length courses in a single non-English or Alaska Native language at the university level **OR** three semester-length courses (9 cr) in American Sign Language.

MATHEMATICS (3–4)
Complete 3-4 credits from the following:
MATH 107X .....(3) _____
OR MATH 131X (except for BBA) ..... (3) _____
OR MATH 161X..... (3) _____
MATH 200X ..... (4) _____
MATH 201X ..... (4) _____
MATH 202X ..... (4) _____
MATH 262X ..... (4) _____
MATH 272X ..... (3) _____
NOTE: Additional 3 cr of math needed for degree requirements.

NATURAL SCIENCES (8)
Complete 8 credits from the following:
ATM 101X ..... (4) _____
BIOL 103X **OR** 104X..... (4) _____
BIOL 105X–106X ..... (8) _____
BIOL 111X–112X ..... (8) _____
CHEM 100X..... (4) _____
CHEM 103X–104X..... (8) _____
CHEM 105X–106X..... (8) _____
GEOG 205X ..... (4) _____
GEOS 100X **OR** 120X **OR** 125X ..... (4) _____
GEOS 101X–112X..... (8) _____
MSL 111X ..... (4) _____
PHYS 102X **OR** 175X..... (4) _____
PHYS 103X–104X..... (8) _____
PHYS 211X–212X..... (8) _____
PHYS 211X–213X..... (8) _____
PHYS 212X–213X..... (8) _____

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