

# CIVIL ENGINEERING

College of Engineering and Mines  
Department of Civil and Environmental Engineering  
907-474-7241  
[www.uaf.edu/cem/cee/](http://www.uaf.edu/cem/cee/)

## B.S. Degree

Minimum Requirements for Degree: 134 credits

Civil engineers plan, design and supervise the construction of public and private structures such as space launching facilities, offshore structures, bridges, buildings, tunnels, highways, transit systems, dams, airports, irrigation projects, and water treatment and distribution facilities.

Civil engineers use sophisticated technology and employ computer-aided engineering during design, construction, project scheduling and cost control project phases. They are creative problem solvers involved in community development and the challenges of pollution, deteriorating infrastructure, traffic congestion, energy needs, floods, earthquakes and urban planning.

The civil engineering program at UAF began in 1922 and graduated its first major in 1931. Many of the more than 800 men and women who have graduated since then work in a wide range of positions all over Alaska. More than 60 percent of Alaska's professional engineers practice in civil engineering. The program at UAF has been accredited since 1940 and is currently accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. All engineering programs in the department give special attention to problems of northern regions.

The civil engineering program educational objectives are:

1. Graduates will have a strong fundamental scientific and technical knowledge base as well as strong critical thinking skills.
2. Graduates will apply their engineering skills to critically analyze and interpret data and be proficient in engineering design accommodating the total project environment.
3. Graduates will be able to communicate with the technical, professional and broader communities in written, verbal and visual formats, including interacting in interdisciplinary contexts.
4. Graduates will demonstrate high standards in ethical, legal and professional obligations to protect human health, welfare and the environment.
5. Graduates will be active in the professional civil engineering community, actively contribute to the profession and pursue lifelong learning.

Graduate students may enter one of two programs: the master of civil engineering is for students whose goal is broad professional practice, and the master of science degree is for those who favor an emphasis on research and specialized study.

In addition to general civil engineering courses, the department offers specialties in transportation, geotechnical, structures, water resources, hydrology and environmental studies. These courses emphasize principles of analysis, planning and engineering design in northern regions.

A master's degree program can include courses in environmental engineering, engineering management and other areas. An advanced degree in environmental engineering administered within the civil engineering department is available.

For more information about the civil engineering program mission, goals and educational objectives, visit [www.uaf.edu/cem/cee/about/](http://www.uaf.edu/cem/cee/about/).

## Major — B.S. Degree

1. Complete the general university requirements. (See page 132. As part of the core curriculum requirements, complete: MATH F200X\*, CHEM F105X\* and CHEM F106X\*.)
2. Complete the B.S. degree requirements. (See page 137. As part of the B.S. degree requirements, complete: MATH F201X\*; PHYS F211X\* and PHYS F212X\*.)
3. Complete the following program (major) requirements:\*

CE F112—Elementary Surveying .....	3
CE F302—Introduction to Transportation Engineering .....	3
CE F326W—Introduction to Geotechnical Engineering.....	4
CE F331—Structural Analysis .....	3
CE F334—Properties of Materials.....	3
CE F344—Water Resources Engineering.....	3
CE F400—FE Exam .....	0
CE F432—Steel Design .....	3
CE F438W,O—Design of Engineered Systems.....	3
CE F441—Environmental Engineering.....	4
CE F490—Civil Engineering Seminar.....	0.5
CE F491—Civil Engineering Seminar.....	0.5
DRT F170—Beginning AutoCAD .....	3
ES F101—Introduction to Engineering .....	3
ES F201—Computer Techniques .....	3
ES F209—Statics .....	3
ES F210—Dynamics.....	3
ES F301—Engineering Analysis .....	3
ES F331—Mechanics of Materials .....	3
ES F341—Fluid Mechanics .....	4
ESM F422—Engineering Decisions.....	3
ESM F450W—Economic Analysis and Operations.....	3
GE F261—General Geology for Engineers.....	3
MATH F202X—Calculus III .....	4
MATH F302—Differential Equations.....	3
Technical electives** .....	12

4. Minimum credits required .....

\* Students must earn a C grade (2.0) or better in each course.

\*\* Technical electives must include 3 credits in the field of environmental engineering or transportation, 6 credits of CE, ENVE, ESM courses or approved technical courses, and 3 credits of either ES F307 or ES F346. Students must earn a C grade (2.0) or better in each technical elective course. Up to two graduate-level courses may be used towards graduation. Graduate-level courses must be approved by student's advisor and the student must be within two semesters of graduation and have at least a 3.0 GPA to take graduate-level courses.

Note: The ability to use computers for normal class work is expected in all engineering classes above the F100-level.

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

## Baccalaureate Core Requirements

(Note: all courses for Core must be at C- or higher.)

### 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**



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