

# Civil Engineering

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

## 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 life-long 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/engineering/ceobjectives.htm](http://www.uaf.edu/engineering/ceobjectives.htm).

## Major—B.S. Degree

1. Complete the general university requirements. (See page 112. As part of the core curriculum requirements, complete: MATH 200X\*, CHEM 105X\* and CHEM 106X\*.)
  2. Complete the B.S. degree requirements. (See page 117. As part of the B.S. degree requirements, complete: MATH 201X\*; PHYS 211X\* and PHYS 212X\*.)
  3. Complete the following program (major) requirements:\*
- |   |     |
|---|-----|
| CE 112—Elementary Surveying.....                        | 3   |
| CE 326W—Introduction to Geotechnical Engineering .....  | 4   |
| CE 334—Properties of Materials.....                     | 3   |
| CE 344—Water Resources Engineering.....                 | 3   |
| CE 400—FE Exam .....                                    | 0   |
| CE 402—Introduction to Transportation Engineering ..... | 3   |
| CE 331—Structural Analysis.....                         | 3   |
| CE 432—Steel Design .....                               | 3   |
| CE 438W,O—Design of Engineered Systems.....             | 3   |
| CE 441—Environmental Engineering.....                   | 4   |
| CE 490—Civil Engineering Seminar.....                   | 5   |
| CE 491—Civil Engineering Seminar.....                   | 5   |
| DRT 170—Beginning AutoCad .....                         | 3   |
| ES 101—Introduction to Engineering.....                 | 3   |
| ES 201—Computer Techniques .....                        | 3   |
| ES 209—Statics .....                                    | 3   |
| ES 210—Dynamics .....                                   | 3   |
| ES 301—Engineering Analysis.....                        | 3   |
| ES 331—Mechanics of Materials.....                      | 3   |
| ES 341—Fluid Mechanics .....                            | 4   |
| ESM 450W—Economic Analysis and Operations.....          | 3   |
| GE 261—General Geology for Engineers .....              | 3   |
| MATH 202X—Calculus.....                                 | 4   |
| MATH 302—Differential Equations .....                   | 3   |
| Technical electives** .....                             | 15  |
| 4. Minimum credits required .....                       | 134 |

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

\*\* Technical electives must include 9 credits of CE, ENVE or ESM courses, 3 credits of either ES 307 or ES 346, and 3 credits of approved technical courses. Students should consult their advisor. Four out of five electives must be taken from approved CE electives or ENVE elective graduate courses. Only one graduate-level course may count toward graduation as a technical elective and the student must be within 30 credits of graduation and have at least a 3.0 GPA to enroll. Students must earn a C grade or better in each technical elective course.

Note: The ability to use computers for normal class work is expected in all engineering classes above the 100-level.

Note: Page numbers refer to the UAF 2006-2007 academic catalog, which can be viewed online at [www.uaf.edu/catalog/](http://www.uaf.edu/catalog/).

## 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 107X, MATH 161X OR MATH 103X ..... (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**