

# CIVIL ENGINEERING

College of Engineering and Mines  
Department of Civil and Environmental Engineering  
907-474-7241  
<http://cem.uaf.edu/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-launch 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 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.

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.

For more information about the civil engineering program mission, goals and educational objectives, visit <http://cem.uaf.edu/cee/abet/>.

## Major — B.S. Degree

1. Complete the general university requirements. (See page 149. As part of the core curriculum requirements, complete: MATH F251X\*, CHEM F105X\* and CHEM F106X\*.)
2. Complete the B.S. degree requirements. (See page 149. As part of the B.S. degree requirements, complete: MATH F252X\*; 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 F341—Environmental Engineering.....	4
CE F344—Water Resources Engineering.....	3
CE F432—Steel Design.....	3
CE F438W,O—Design of Engineered Systems.....	3
CE F490—Civil Engineering Seminar.....	0.5
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DRT F210—Intermediate CAD.....	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 F253X—Calculus III.....	4
MATH F302—Differential Equations.....	3
Technical electives**.....	12

4. Complete the Fundamentals of Engineering (FE) examination administered by the State of Alaska.

5. Minimum credits required .....134

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

\*\* Technical electives must include 3 credits in the field of environmental engineering, construction, 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 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.

# Baccalaureate Core Requirements

## Communication . . . . . 9 Credits

- ENGL F111X—Introduction to Academic Writing.....(3)

Complete one of the following:

- ENGL F211X—Academic Writing about Literature.....(3)
- ENGL F213X—Academic Writing about the Social and Natural Sciences.....(3)

Complete one of the following:

- COMM F121X—Introduction to Interpersonal Communication.....(3)
- COMM F131X—Fundamentals of Oral Communication: Group Context.....(3)
- COMM F141X—Fundamentals of Oral Communication: Public Context.....(3)

## Perspectives on the Human Condition . . . . . 18 Credits

Complete all of the following four courses:

- ANTH F100X/SOC F100X—Individual, Society and Culture.....(3)
- ECON F100X or PS F100X—Political Economy.....(3)
- HIST F100X—Modern World History.....(3)
- ENGL/FL F200X—World Literature.....(3)

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Complete one of the following three courses:

- ART/MUS/THR F200X—Aesthetic Appreciation: Interrelationship of Art, Drama and Music.....(3)
- HUM F201X—Unity in the Arts.....(3)
- ANS F202X—Aesthetic Appreciation of Alaska Native Performance.....(3)

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Complete one of the following six courses:

- BA F323X—Business Ethics.....(3)
- COMM F300X—Communicating Ethics.....(3)
- JUST F300X—Ethics and Justice.....(3)
- NRM F303X—Environmental Ethics and Actions.....(3)
- PS F300X—Ethics and Society.....(3)
- PHIL F322X—Ethics.....(3)

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Or complete 12 credits from the above courses plus one of the following:

- Two semester-length courses in a single Alaska Native language or other non-English language
- Three semester-length courses (9 credits) in American Sign Language taken at the university level.

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## Mathematics . . . . . 3 Credits

Complete one of the following:

- MATH F113X—Concepts and Contemporary Applications of Mathematics.....(3)
- MATH F151X—College Algebra for Calculus\*.....(4)
- MATH F152X—Trigonometry.....(4)
- MATH F156X—Precalculus.....(4)
- MATH F122X—Algebra for Business and Economics\*\*.....(3)
- STAT F200X—Elementary Probability and Statistics.....(3)

\* No credit may be earned for more than one of MATH F151X or F122X.

Or complete one of the following\*:

- MATH F251X—Calculus I\*\*.....(4)
- MATH F252X—Calculus II.....(4)
- MATH F253X—Calculus III.....(4)
- MATH F222X—Calculus for Business and Economics.....(4)
- MATH F232X—Calculus for Life Sciences.....(4)

\* Or any math course having one of these as a prerequisite

\*\* No credit may be earned for more than one of MATH F251X, F222X or F232X.

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## Natural Sciences . . . . . 8 Credits

Complete any two (4-credit) courses.

- ATM F101X—Weather and Climate of Alaska.....(4)
- BIOL F100X—Human Biology.....(4)
- BIOL F101X—Introduction to Animal Behavior.....(4)
- BIOL F103X—Biology and Society.....(4)
- BIOL F104X—Natural History.....(4)
- BIOL F115X—Fundamentals of Biology I.....(4)
- BIOL F116X—Fundamentals of Biology II.....(4)
- BIOL F120X—Introduction to Human Nutrition.....(4)
- BIOL F213X—Human Anatomy and Physiology I.....(4)
- BIOL F214X—Human Anatomy and Physiology II.....(4)
- CHEM F100X—Chemistry in Complex Systems.....(4)
- CHEM F103X—Basic General Chemistry.....(4)
- CHEM F104X—Beginnings in Biochemistry.....(4)
- CHEM F105X—General Chemistry.....(4)
- CHEM F106X—General Chemistry.....(4)
- GEOG F111X—Earth and Environment: Elements of Physical Geography.....(4)
- GEOS F100X—Introduction to Earth Science.....(4)
- GEOS F101X—The Dynamic Earth.....(4)
- GEOS F106X—Life and the Age of Dinosaurs.....(4)
- GEOS F112X—History of Earth and Life.....(4)
- GEOS F120X—Glaciers, Earthquakes and Volcanoes.....(4)
- GEOS F125X—Humans, Earth and Environment.....(4)
- MSL F111X—The Oceans.....(4)
- PHYS F102X—Energy and Society.....(4)
- PHYS F103X—College Physics.....(4)
- PHYS F104X—College Physics.....(4)
- PHYS F115X—Physical Science I.....(4)
- PHYS F175X—Astronomy.....(4)
- PHYS F211X—General Physics.....(4)
- PHYS F212X—General Physics.....(4)
- PHYS F213X—Elementary Modern Physics.....(4)

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## Library and Information Research . . . . . 0-1 Credit

- Successful completion of library skills competency test or LS F100X or LS F101X prior to junior standing

0-1

## Upper-Division Writing and Oral Communication

Complete the following at the upper-division level:

- Two writing intensive courses designated (W) and one oral communication intensive course designated (O), or two oral communication intensive courses designated (O/2) (see degree and/or major requirements)

Total credits required 38-39

All degrees (e.g. B.A., B.S., etc.) require additional courses.

Refer to specific degree and program requirements.

Students must earn a C- grade or better in each course used toward the baccalaureate core.

