



Department of Civil and Environmental Engineering

Contact Information

Civil and Environmental
Engineering,
University of
Alaska Fairbanks,
P.O. Box 755900
Fairbanks, AK
99775-5900
(907)474-7241
fycee@uaf.edu

Fax (907) 474-6087

[Home](#)

[About CEE](#)

[Undergraduate](#)

[Graduate](#)

[Research](#)

[People](#)

CEE ABET

Implementation Plan for CEE Vision and Mission Statements

The UAF Department of Civil and Environmental Engineering will implement its [vision](#) and [mission](#) statements by having stated educational objectives, strategies for meeting these objectives, and assessment of outcomes.

[Educational Objectives and Strategies](#) | [Outcomes Assessment](#) | [ABET 2000](#)

[Evaluation and Monitoring](#) | [Assessment Tools](#) | [Corrective Action](#)

Our Vision

The Department of Civil and Environmental Engineering at the University of Alaska Fairbanks believes that the successful and productive engineer has an intimate knowledge of the fundamentals, is fluent in the tools of modern engineering, and is skilled in the ways of professional practice. We believe that fundamental engineering and science have long been and will continue to be a most important resource from which engineers draw throughout their careers. At UAF we also believe in preparing engineers in the use of the latest engineering tools and applications. Engineers only achieve success if they master the skills of professional practice including, communication, ethics and integrity in design.

As a land grant institution, our commitment to undergraduate education is clear. We also seek to enhance our engineering experience through research and graduate education. We believe that an environment encouraging research advances the engineering body of knowledge and is essential to the advancement of students and faculty alike. MS and Ph.D. students apply the latest engineering tools, develop the latest concepts, and advance the state of the art. We seek to provide research exposure and opportunities to undergraduate students so that they may also achieve the highest scholarship.

Our Mission

- We will provide the highest level of undergraduate education. This will include competency in mathematics, science, engineering fundamentals as well as training in design, the latest engineering applications, and professional practice.
- We will provide an environment encouraging research for engineers at the undergraduate, masters and doctorate levels. We see integration of research and teaching as critical to our mission.
- We seek to impart a desire for life-long learning so that engineers from the UAF Department of Civil and Environmental Engineering remain atop their field throughout their career.

[top](#)

EDUCATIONAL OBJECTIVES AND STRATEGIES

Objective 1. Civil and Environmental Engineering students will receive an education that includes language, communications, art, humanities and culture to prepare them to be productive engineers in a diverse society.

Strategy for meeting Objective 1: In conjunction with the University of Alaska Fairbanks core requirements, Civil and Environmental Engineering students complete a minimum of 27 semester credits representing a breadth of study in the humanities, social sciences, ethics, language and communication. These courses include:

9 credits in Communications (incl. academic writing and oral communication)

18 credits in Perspectives on the Human Condition incl:

- modern world history
- political economy
- world literature
- individuals, society and culture
- aesthetic appreciation
- ethics
- OR 4 of the above and 2 semesters of a non-english language or 3 semesters in American sign language

- 2 courses that have been designated as writing intensive
- 1 course that has been designated as oral intensive

[top](#)

Objective 2. Civil and Environmental Engineering students will be competent in fundamental math and science.

Strategy for meeting objective 2: Civil and Environmental Engineering students shall complete sequences in math,

chemistry and physics to prepare them for all level of engineering analysis. These courses must include:

- calculus I, II and III (12 credits)
- ordinary differential equations (3 credits)
- calculus based physics I and II (8 credits)
- chemistry I and II (8 credits)

Objective 3. Civil and Environmental Engineering students will be competent in core engineering fundamentals based on topics outlined in the Fundamentals of Engineering Exam.

- Chemistry
- Statics/dynamics
- Electric circuits/computers
- Engineering economics/ethics
- Fluid mechanics
- Mechanics of materials
- Mathematics/engineering analysis
- Thermodynamics

Strategy for meeting objective 3: Emphasize engineering fundamentals in curriculum and annually evaluate outcomes based on Fundamentals of Engineering Exam performance.

Objective 4. Civil and Environmental Engineering students will be competent in core Civil Engineering fundamentals including:

- Water resources (3)
- Structures (3)
- Surveying (3)
- Environmental (4)
- Transportation (3)
- Geotechnical (3)
- Mechanics (3)

Strategy for meeting objective 4: Provide courses specific to Civil and Environmental Engineering, and monitor progress through the discipline specific segment of the Fundamentals of Engineering Exam and periodic review by the departmental curriculum committee.

[top](#)

Objective 5. Students will have the opportunity to specialize and demonstrate competence in a subdiscipline within their chosen field.

Strategy for meeting objective 5:

- provide opportunities for at least 15 credits of technical electives
- offer undergraduate research opportunities
- provide a graduate program and facilitate graduate/undergraduate student interaction

Objective 6. All engineering students will be proficient in engineering design.

Strategy for meeting objective 6:

- require that a minimum 20% of the engineering course work be design-based
- require that design be integrated throughout the curriculum

[top](#)

Objective 7. All engineering students will demonstrate design competence through a major design (capstone) experience

focused on the following:

- designing a project, device, system, or process incorporating engineering standards and realistic constraints that include most of the following considerations: economic, environmental, sustainability, manufacturability, ethical, health and safety, social, and political
- consideration of the implications and relationships of their designs to societal, global, contemporary, and ethical issues
- written and verbal communication
- including interdisciplinary team members where feasible
- using design methodology, computer applications, and/or experimental apparatus that are modern and appropriate to the discipline

working effectively in a team environment **Strategy for meeting objective 7:** Require as a minimum, a 3 credit capstone course which is team based. The focus of the experience will be to integrate their 4-year experience into a single project. The capstone project will include review from peer groups, faculty, and industry.

[top](#)

Objective 8. All engineering students will be laboratory and computer proficient with modern equipment and current laboratory and computer methods.

Strategy for meeting objective 8: Require students to:

- take two courses of basic science with a laboratory component (Chemistry)
- take two courses of engineering with a laboratory component
- design as well as run experiments
- take a minimum of 3 credits of computing

OUTCOMES ASSESSMENT

Step 1. Students shall demonstrate skills in math, science, and engineering with an emphasis on solving engineering problems utilizing fundamental engineering principals including engineering logic, traditional analytical methods, modern software, and experimental apparatus. (ABET2000 outcomes a, b, e, k)

Civil Engineering graduates will be:

- competent in mechanics, mathematics and engineering sciences and rely on these skills as the foundation of their technical careers.
- capable of utilizing modern software as a standard tool in the design or analysis process

Step 2. Students shall demonstrate an understanding and philosophy that promotes engineering practice founded in technical integrity, ethics, social and environmental responsibility, global awareness, and a recognition of preparing themselves for continued education and independent thought. (ABET 2000 outcomes f, g, h, i, j)

Civil Engineering graduates will:

- have an awareness of ethical practice, and the importance of licensure.
- conscientiously consider social views and the environment in the design work they propose and perform.
- have an appreciation of their responsibility to continue to learn through additional formal education or through professional development opportunities.

Step 3. Students shall demonstrate throughout the curriculum, but primarily through the capstone course, the ability to assimilate course material from multiple courses, design a system or process, communicate that design effectively through verbal and written means, and work effectively on a design team. (ABET 2000 outcomes c, d, g, k)

More specifically and in addition to the above Civil Engineering graduates will:

- have a broad understanding over the whole of Civil Engineering.
- understand the importance of teamwork, the value of multiple disciplines. Be able to communicate to broad array of technical and nontechnical audiences.
- bring design expertise to the work environment in a subset of the Civil Engineering disciplines

[top](#)

ABET 2000 PRESCRIBED OUTCOMES

- a. math, science, engineering skills
- b. design and conduct experiments and analyze data
- c. design a system or process
- d. function on multidisciplinary teams
- e. solve engineering problems
- f. understand ethical and professional responsibility
- g. ability to communicate
- h. understand impact of engineering in a global and societal context
- i. recognize lifelong learning
- j. knowledge of contemporary issues
- k. ability to use techniques, skills, and modern engineering tools.

[top](#)

EVALUATION AND MONITORING OF PROGRESS

- Annual report is prepared with sections that outline the following:
 - action taken in the previous year as a result of assessment
 - results from assessment instruments
 - action to be taken in the next year
 - reassessment of objectives
- Annual departmental session to reassess departmental goals and directions.

[top](#)

ASSESSMENT TOOLS

1. Fundamentals of Engineering Exam

- A requirement for graduation will be to take the FE exam.
- Document program performance in each category for each portion of the exam (general and discipline specific).
- Determine strengths and weaknesses based on documented performance.
- Results documented yearly and summarized in the Annual Report.

2. Senior Survey

- Seniors will be given an opportunity to comment on their educational experience through a senior survey
- Results will be documented yearly and summarized in the Annual Report.

3. Departmental External Advisory Committee

- Assess students' ethical responsibility, communication, knowledge of societal context, recognition of lifelong learning, and knowledge of contemporary issues.
- Results documented yearly and summarized in the Annual Report.

4. Employer Survey Every Three Years

- Mail survey to employers every three years to assess performance of our alumni.
- Survey will be broad-based, including college and departmental questions, and cover a breadth of criteria.
- Historical data from instrument will be used to chart progress of UAF Civil and Environmental Engineering graduates and their advancement into senior technical and management positions.
- Results documented yearly and summarized in the Annual Report.

5. Alumni Survey

- The design instrument will encompass broad-based departmental questions, including questions to measure the recognition of lifelong learning.
- Mail out graduate survey to alumni 2 and 5 years out of school.
- Results documented and summarized in the Annual Report

[top](#)

6. Corrective Action

- Assess status of programs based on data from a minimum of assessment instruments 1-5.
 - Based on feedback, provide direction for needed changes in programs.
 - Provide State of the Program Report each year; discuss actions taken the previous year and results achieved, suggestions that need to be considered for the upcoming year, and data that needs to be collected.
 - Summary of State of the Program Report provided in the Annual Report each year.
 - Departmental Advisory Boards review the State of the Program Report each year.
-

[top](#)

Please link here to see tables--coming soon