CEM Academic Programs

Undergraduate:
- **Civil Engineering**
  - B.S. in Civil Engineering
- **Electrical and Computer Engineering**
  - B.S. Electrical Engineering
  - B.S. Computer Engineering
- **Petroleum Engineering**
  - B.S. Petroleum
- **Mining and Geological Engineering**
  - B.S. Mining Engineering
  - B.S. Geological Engineering
- **Mechanical Engineering**
  - B.S. Mechanical Engineering
- **Computer Science**
  - B.S. Computer Science

Graduate:
- **Civil Engineering**
  - M.S./Ph.D. Civil Engineering
  - M.C.E. Civil Engineering
  - M.S./Ph.D. Arctic Engineering
  - M.S./Ph.D. Engineering Management
  - M.S./Ph.D. Environmental Engineering
  - M.S. Environmental Quality Science
- **Electrical Engineering**
  - M.E.E. Electrical Engineering
  - M.S./Ph.D. Electrical Engineering
- **Petroleum Engineering**
  - M.S. Petroleum Engineering
- **Mining and Geological Engineering**
  - M.S./Ph.D. Geological Engineering
  - M.S. Mineral Preparation
  - M.S./Ph.D. Mining Engineering
- **Mechanical Engineering**
  - M.S./Ph.D. Mechanical Engineering
- **Computer Science**
  - M.S. Computer Science
  - M.S. Software Engineering
Facility Expansion
Student Success

UAF Students Awarded “Best Design” at 2011 SAE Zero-Emission Snowmachine Competition

2011 ASCE Steel Bridge Team

UAF to Launch the Alaska Cube-Sat in 2013 with the support of NASA

UAF Students on NASA’s Zero-G Aircraft
Institute of Northern Engineering

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INE General Research (IGR)
Some faculty conduct research directly through INE in areas such as vehicle development, robotics, sensor networks, materials research, atmospheric studies, & engineering-relevant toxicology issues. To learn more, contact INE Director Dan White, 907-474-5457.
Alaska Center for Energy & Power

- Community Energy Solutions
- Powering the Economy
- Energyfield of the Future
Transportation Focus Areas:

- Ports and Harbors
- Dust Abatement
- Improvement of Asphalts and Concrete for Cold Regions
- Vegetation Control
- Marine Highway
- Soil Liquifaction
Mineral Industry Research Lab

- Coal Processing
- Economic Minerals
- Transportation and Logistics
- Mining Techniques
- Rare Earth Minerals
Petroleum Development Laboratory

**Mission:**

- Resource Characterization, Quantification and Development
  - Conventional oil (EOR)
  - Heavy oil (EOR)
  - Natural gas
  - Gas hydrate/associated free gas
  - CO2 Sequestration (CO2 Hydrates and EOR)
  - GTL Transportation, and
  - CBM resources

**Vision:**

Through integrated academic, industry, & government collaborative research to promote safe, low cost, & environmentally responsible production of abundant, strategic resources and secure energy needs of the State of Alaska and the nation.
Joint-Industry Project Examples:

- **Arctic Transportation Network**: Developing tools for nowcast and short-term forecast of snow, soil, and ice conditions to support tundra travel.

- **North Slope Decision Support System**: Developing online tools for ice road planning, routing, permitting, and communication between stakeholders.

- **Evaluating the Effects of Dispersed Oil on Cold Water Environments of the Beaufort and Chukchi Seas**: Seminal study testing Alaskan indicator species under Alaskan field conditions.
Permafrost River
Bank Erosion
Permafrost River Bank Erosion
Longitudinal cracking soon after reconstruction of Farmer’s Loop Road, Fairbanks, Alaska

Differential settlement along an unmaintained section of the Richardson Highway, Interior Alaska
Permafrost and Roadways
Thermal Erosion in Permafrost

Figure 8 - Fortier et al.
Thermal Erosion in Permafrost

Photo by Daniel Fortier
Thanks!

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