

# PETROLEUM ENGINEERING

College of Engineering and Mines  
 Department of Petroleum Engineering  
 907-474-7734  
<http://cem.uaf.edu/pete/>

## BS Degree

Minimum Requirements for Degree: 133 credits

The mission of the petroleum engineering program is to provide its students with quality education and training in the field of petroleum engineering through effective teaching, research and public service, with emphasis on Alaska petroleum resources.

Petroleum engineering offers a unique look at the challenging problems confronting the petroleum industry. This program requires an understanding of many disciplines including mathematics, physics, chemistry, geology and engineering science. Courses in petroleum engineering deal with drilling, formation evaluation, production, reservoir engineering, computer simulation and enhanced oil recovery.

The curriculum prepares graduates to meet the demands of modern technology while emphasizing, whenever possible, the special problems encountered in Alaska. Located in one of the largest oil-producing states in the nation, the UAF petroleum engineering department offers one of the most modern and challenging degree programs available.

The petroleum engineering program educational objectives are:

1. Our graduates will possess the technical knowledge and skills required to analyze real world petroleum engineering problems, and develop innovative solutions that meet the needs of multiple stakeholders.
2. Our graduates will recognize the value of continuing professional development throughout their careers. This may take the form of advanced degrees, industry courses, and formal mentoring and coaching.
3. Our graduates will compete effectively in the global petroleum engineering profession and they will exhibit the behaviors necessary to become leaders in the Alaska petroleum industry and beyond.

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

## Major — BS Degree

1. Complete the general university requirements. (See page 129. As part of the core curriculum requirements, complete: MATH F200X, CHEM F105X and F106X, and LS F101X.)

2. Complete the BS degree requirements. (See page 134. As part of the BS degree requirements, complete: MATH F201X, PHYS F211X and F212X.)
3. Complete the following program (major) requirements:\*
 

ES F201—Computer Techniques.....	3
ES F208—Mechanics.....	4
ES F331—Mechanics of Materials.....	3
ES F341—Fluid Mechanics.....	4
ES F346—Basic Thermodynamics.....	3
GE F261—General Geology for Engineers (3)	
or GEOS F101X—The Dynamic Earth (4).....	3–4
GEOS F370—Sedimentary and Structural Geology for Petroleum Engineers.....	4
PETE F101—Fundamentals of Petroleum, Drilling and Production.....	3
PETE F301—Reservoir Rock and Fluid Properties.....	4
PETE F302—Well Logging.....	3
PETE F303W—Reservoir Rock and Fluid Properties Laboratory ....	1
PETE F407—Petroleum Production Engineering.....	3
PETE F411W—Drilling Fluids Laboratory.....	1
PETE F421—Reservoir Characterization.....	3
PETE F426—Drilling Engineering.....	3
PETE F431—Natural Gas Engineering.....	2
PETE F456—Petroleum Evaluation and Economic Decisions.....	3
PETE F466—Petroleum Recovery Methods.....	3
PETE F476—Petroleum Reservoir Engineering.....	3
PETE F478—Well Test Analysis.....	2
PETE F481W—Well Completions and Stimulation Design.....	3
PETE F487A—Petroleum Project Design**.....	1
PETE F487BW,O—Petroleum Project Design.....	1
PETE F489—Reservoir Simulation.....	2
Engineering elective***.....	3
Technical elective****.....	3
4. Complete the following program (major) requirements:
 

MATH F202X—Calculus III.....	4
MATH F302—Differential Equations.....	3
MATH F310—Numerical Analysis (3)	
or ES F301—Engineering Analysis (3).....	3
5. Complete the Fundamentals of Engineering Exam (as approved by the Board of Architects, Engineers and Land Surveyors).
6. Minimum credits required.....133

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

\*\* PETE F487A is prerequisite for PETE F487B. Must take both courses to meet the oral communication and writing-intensive requirements.

\*\*\* As approved by advisor (e.g. ME F416 or ES F307).

\*\*\*\* As approved by advisor (e.g. CE F603).



## Baccalaureate Core Requirements

### Communication . . . . . 9 Credits

- ENGL F111X—Introduction to Academic Writing.....(3)  
*ENGL F190H may be substituted.*

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

**9**

### 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)

**12**

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)

**3**

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)

**3**

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.

**6–9**

### Mathematics . . . . . 3 Credits

Complete one of the following:

- MATH F103X—Concepts and Contemporary Applications of Mathematics.....(3)
  - MATH F107X—Functions for Calculus\*.....(4)
  - MATH F161X—Algebra for Business and Economics\*\*.....(3)
  - STAT F200X—Elementary Probability and Statistics.....(3)
- \* No credit may be earned for more than one of MATH F107X or F161X.

Or complete one of the following\*:

- MATH F200X—Calculus I\*\*.....(4)
- MATH F201X—Calculus II.....(4)
- MATH F202X—Calculus III.....(4)
- MATH F262X—Calculus for Business and Economics.....(4)
- MATH F272X—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 F200X, F262X or F272.

**3–4**

### 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—Biology of Sex.....(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)

**8**

### 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.

