

Physics, Applied

College of Natural Science and Mathematics
Department of Physics
(907) 474-7339
www.uaf.edu/physics/

B.S. Degree

Minimum Requirements for Degree: 130 credits

The science of physics is concerned with the nature of matter and energy for all physical systems, from elementary particles to the structure and origin of the universe. Physics, together with mathematics and chemistry, provides the foundation for work in all fields of the physical sciences and engineering and contributes greatly to other fields such as the biosciences and medicine.

The field of applied physics encompasses those areas that have developed practical applications from fundamental research in physics in the last century, including space physics, plasma physics, condensed matter physics, device physics, surface physics, biophysics, laser physics and reactor physics.

The undergraduate curriculum provides a solid foundation in general physics. Students may study applied physics in one of two concentrations or may design a course of study appropriate for individual goals. Examples outside the approved concentrations could include engineering physics and technical management. In all cases, the credits in applied physics (items “d” and “e” in each course outline) must be appropriate for the chosen subject area.

Major—B.S. Degree

1. Complete the general university requirements. (See page 112. As part of the core curriculum requirements, complete MATH 200X.)
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:
 - a. Complete the following:

MATH 202X—Calculus.....	4
MATH 302—Differential Equations	3
PHYS 213X—Elementary Modern Physics*.....	4
PHYS 311—Mechanics*.....	4
PHYS 331—Electricity and Magnetism*.....	3
 - b. Complete mathematics credits at the 200-level or above.....9
 - c. Complete physics credits at the 300-level or above*.....12
 - d. Complete credits in applied physics* (see note).....20
4. Minimum credits required.....130

Concentrations: Atmospheric Physics, Computational Physics

Atmospheric Physics

1. Complete the general university requirements. (See page 112. As part of the core curriculum requirements, complete: MATH 200X.)
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:
 - a. Complete the following:

MATH 202X—Calculus.....	4
MATH 302—Differential Equations	3
PHYS 213X—Elementary Modern Physics*.....	4
PHYS 311—Mechanics*.....	4
PHYS 331—Electricity and Magnetism*.....	3
 - b. Complete mathematics credits at the 200-level or above.....9
 - c. Complete physics credits at the 300-level or above*.....12
 - d. Complete the following:*

ATM 401—Introduction to Atmospheric Science.....	3
ATM 413—Atmospheric Radiation.....	3
ATM 445—Atmospheric Dynamics.....	3
 - e. Complete credits in other relevant upper-division courses* ..(see note).....8
4. Minimum credits required.....130

Computational Physics

1. Complete the general university requirements. (See page 112. As part of the core curriculum requirements, complete MATH 200X.)
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:
 - a. Complete the following:

MATH 202X—Calculus.....	4
MATH 302—Differential Equations	3
PHYS 213X—Elementary Modern Physics*.....	4
PHYS 311—Mechanics*.....	4
PHYS 331—Electricity and Magnetism*.....	3
 - b. Complete mathematics credits at the 200-level or above.....9
 - c. Complete physics credits at the 300-level or above*.....12
 - d. Complete the following:*

PHYS 220—Introduction to Computational Physics.....	4
MATH 310—Numerical Analysis.....	3
CS 201—Computer Science I.....	3
CS 202—Computer Science II.....	3

Complete credits in other relevant upper-division courses* (see note)4
4. Minimum credits required.....130

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

Note: These credits must be in a chosen subject area and approved before the beginning of the student's final semester by the head of the physics department.

Note: Must exclude PHYS 103X and 104 from core curriculum natural science requirement.

See General Science.

Note: Page numbers refer to the UAF 2006-2007 academic catalog, which can be viewed online at 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**