

B.S., PHYSICS

Minimum Requirements for Degree: 120 credits

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

| Code | Title | Credits |
|--|---|---------|
| General University Requirements | | |
| Complete the general university requirements. (http://catalog.uaf.edu/bachelors) | | |
| General Education Requirements | | |
| Complete the general education requirements. (http://catalog.uaf.edu/bachelors/general-education-requirements) | | |
| As part of the general education requirements, complete: | | |
| MATH F251X | Calculus I | |
| B.S. Degree Requirements | | |
| Complete the B.S. degree requirements. (http://catalog.uaf.edu/bachelors/summary-of-bachelors-degree-reqs/#bachelorofsciencetext) | | |
| As part of the B.S. degree requirements, complete: | | |
| MATH F252X | Calculus II | |
| PHYS F211X | General Physics I | |
| PHYS F212X | General Physics II | |
| Program Requirements | | |
| MATH F253X | Calculus III | 4 |
| PHYS F213X | Elementary Modern Physics | 4 |
| PHYS F220 | Introduction to Computational Physics | 4 |
| PHYS F301 | Introduction to Mathematical Physics | 4 |
| PHYS F341 | Classical Physics I: Particle Mechanics | 4 |
| PHYS F342 | Classical Physics II: Electricity and Magnetism | 4 |
| PHYS F400 | Capstone Project ¹ | 0 |
| Concentrations | | |
| Complete one from the following concentrations: | | 31-40 |
| Physics | | |
| Applied Physics | | |
| Atmospheric Physics | | |
| Computational Physics | | |
| Technical Management | | |

¹ Satisfy the capstone project requirement by passing PHYS F400, Capstone Project (0 credits).
The capstone project can be done either as individual undergraduate research with a faculty member (by taking PHYS F488 - 2 credits) or as an independent study with a faculty member within any F300- or F400-level physics course (by taking PHYS F497 - 2 credits), or as participation in the international University Physics Competition. Credits required to fulfill the capstone experience do not count toward credits required to complete the concentration.

Concentrations PHYSICS

| Code | Title | Credits |
|--|-------|---------|
| Program Requirements | | |
| Complete the following: | | |
| MATH electives at the F300 level or above ¹ | | 6 |

| | | |
|--|---|---|
| PHYS F343 | Classical Physics III: Vibration and Waves | 4 |
| PHYS F351 | Thermal Physics | 2 |
| PHYS F381 | Physics Laboratory | 3 |
| PHYS F421 | Quantum Mechanics | 4 |
| PHYS F451 | Statistical Physics | 2 |
| PHYS F462 | Geometrical and Physical Optics | 4 |
| Complete 6 credits from the following: | | 6 |
| PHYS F471A | Advanced Topics in Physics I: Condensed Matter Physics I | |
| PHYS F471B | Advanced Topics in Physics I: Condensed Matter Physics II | |
| PHYS F471C | Advanced Topics in Physics I: Space and Auroral Physics | |
| PHYS F471D | Advanced Topics in Physics I: Nonlinear Dynamics | |
| PHYS F471E | Advanced Topics in Physics I: Biophysics | |
| PHYS F471F | Advanced Topics in Physics I: Nuclear and Particle Physics | |
| PHYS F471G | Advanced Topics in Physics I: General Relativity | |
| PHYS F471H | Advanced Topics in Physics I: Astrophysics | |
| PHYS F471I | Advanced Topics in Physics I: Topics in Modern Mathematical Physics | |
| PHYS F471J | Advanced Topics in Physics I: Order of Magnitude Physics | |
| PHYS F472A | Advanced Topics in Physics II: Planetary Atmospheres | |
| PHYS F472B | Advanced Topics in Physics II: Fluid Dynamics | |
| PHYS F472C | Advanced Topics in Physics II: Plasma Physics | |
| PHYS F472D | Advanced Topics in Physics II: Hamiltonian Mechanics | |
| PHYS F472E | Advanced Topics in Physics II: Physics of Glaciers | |
| PHYS F472F | Advanced Topics in Physics II: Remote Sensing | |
| PHYS F472G | Advanced Topics in Physics II: Solar Physics | |
| PHYS F472H | Advanced Topics in Physics II: Advanced Laboratory | |
| PHYS F472I | Advanced Topics in Physics II: Spectroscopy | |
| PHYS F472J | Advanced Topics in Physics II: Cosmology | |
| PHYS F472K | Advanced Topics in Physics II: Quantum Computation | |
| PHYS F472L | Advanced Topics in Physics II: Covariant Kinematics/Dynamics | |
| PHYS F472Z | Advanced Topics in Physics II: Current Topics in Physics | |

¹ Recommended courses include MATH F314, MATH F421 and MATH F422.

APPLIED PHYSICS

| Code | Title | Credits |
|--|-------|---------|
| Program Requirements | | |
| Complete the following: | | |
| MATH electives at the F300 level or above ¹ | | 6 |
| Physics credits at the F300 level or above | | 9 |
| Applied physics ² | | 17 |

¹ Recommended courses include MATH F314, MATH F421 and MATH F422.

² The 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.

ATMOSPHERIC PHYSICS

| Code | Title | Credits |
|--|--------------------------------------|---------|
| Program Requirements | | |
| Complete the following: | | |
| MATH electives at the F300 level or above ¹ | | 6 |
| Physics credits at the F300 level or above | | 9 |
| ATM F401 | Introduction to Atmospheric Sciences | 3 |
| ATM F413 | Atmospheric Radiation | 3 |
| ATM F445 | Atmospheric Dynamics | 3 |
| Other relevant upper-division courses. ² | | 8 |

¹ Recommended courses include MATH F314, MATH F421 and MATH F422.

² The 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.

COMPUTATIONAL PHYSICS

| Code | Title | Credits |
|--|---------------------|---------|
| Program Requirements | | |
| Complete the following: | | |
| MATH electives at the F300 level or above ¹ | | 6 |
| Physics credits at the F300 level or above | | 9 |
| CS F201 | Computer Science I | 3 |
| CS F202 | Computer Science II | 3 |
| MATH F310 | Numerical Analysis | 3 |
| Other relevant upper-division courses. ² | | 8 |

¹ Recommended courses include MATH F314, MATH F421 and MATH F422.

² The 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.

TECHNICAL MANAGEMENT

| Code | Title | Credits |
|--|-------|---------|
| Program Requirements | | |
| Complete the following: | | |
| MATH electives at the F300 level or above ¹ | | 3 |

| | | |
|--|---|----|
| STAT F200X | Elementary Statistics | 3 |
| Physics credits at the F300 level or above | | 12 |
| ACCT F261X | Principles of Financial Accounting | 3 |
| ACCT F262 | Principles of Managerial Accounting | 3 |
| School of Management Courses ² | | |
| BA F325 | Financial Management ³ | 3 |
| BA F330 | The Legal Environment of Business ³ | 4 |
| BA F343 | Principles of Marketing ³ | 3 |
| BA F360 | Operations Management ³ | 3 |
| BA F390 | Organizational Theory and Behavior ³ | 3 |

¹ Recommended courses include MATH F314, MATH F421 and MATH F422.

² Students must take ACCT F261X, MATH F253X and PHYS F220 before taking these courses; or have permission of the MBA director. The School of Management agrees that such students will be allowed to register for these courses.

³ Students can be required to earn a B grade or higher if applying for the MBA program.

Note: Other courses suggested to fulfill minimum credit requirements: ES F201 and ES F307.

Note: Must exclude PHYS F103X and PHYS F104X from core curriculum natural science requirement.

Requirements for physics teachers (grades 7-12)

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

| Code | Title | Credits |
|---|--|---------|
| Program Requirements | | |
| Complete all the requirements of the B.S. degree | | |
| All prospective physics teachers must complete the following: | | |
| CHEM F105X and CHEM F106X | General Chemistry I and General Chemistry II | 8 |
| PHYS F211X | General Physics I | 4 |
| PHYS F212X | General Physics II | 4 |
| PHYS F213X | Elementary Modern Physics | 4 |
| PHYS F220 | Introduction to Computational Physics | 4 |
| PHYS F301 | Introduction to Mathematical Physics | 4 |
| MATH electives | | 3 |
| Physics-approved electives | | 16 |
| All prospective science teachers must complete the following: | | |
| PHIL F481 | Philosophy of Science | 3 |

Note: We strongly recommend that prospective secondary science teachers seek advising from the Alaska College of Education early in their undergraduate degree program so they can be appropriately advised of the State of Alaska requirements for teacher licensure. Students will apply for admission to the Alaska College of Education's postbaccalaureate teacher preparation program, a one-year intensive program, during their senior year.