

# PHYSICS

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## B.S., M.S., Ph.D. Degrees, Minor B.S., PHYSICS

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 disciplines such as biosciences and medicine.

The undergraduate curriculum provides a solid foundation in classical and modern physics, with emphasis on both its experimental and theoretical aspects. A student completing this curriculum can be well-prepared for advanced study in physics and related sciences, and for other careers in industry, government or the private sector that require refined abilities in problem-solving.

The physics concentration represents the classical undergraduate physics curriculum, while the applied physics concentration provides a solid foundation in general physics with the flexibility to include applied or interdisciplinary coursework, aimed at e.g., engineering physics, biophysics or oceanography.

The atmospheric physics concentration is a solid foundation at the interface of physics, climate sciences and meteorology. The computational physics concentration is relevant for students seeking careers in any areas that require expertise in computational modeling and simulation of physical systems.

The technical management concentration provides an opportunity to combine basic knowledge of physics with an aptitude for leadership in business. Declared physics majors in good standing with appropriate grades, department mentoring and approval for some courses are, upon graduation, welcome to apply to the MBA program in UAF's College of Business and Security Management.

Minimum Requirements for Physics Bachelor's Degree: 120 credits

Learn more about the bachelor's degree in physics (<https://uaf.edu/academics/programs/bachelors/physics.php>), including an overview of the program, career opportunities and more.

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## M.S., PH.D., PHYSICS

Advanced study at the graduate level is offered in various areas of physics and applied physics, including many of the research specialties found at the UAF's Geophysical Institute. Faculty and student research programs currently emphasize space physics, infrasonics, complex dynamics of nonlinear systems, ice physics and condensed matter physics.

The M.S. degree with computational physics concentration provides expertise in advanced computing environments, in the relevant mathematical foundations and in the specific physics discipline. It is directed toward students with undergraduate academic backgrounds in physics or other closely associated fields, such as engineering, that have the appropriate physics coursework. This degree is relevant for students seeking careers in any areas that require expertise in computational modeling and simulation of physical systems.

The M.S. degree with space physics concentration focuses on the physics of upper atmospheres, ionospheres, magnetospheres and the interplanetary medium. It includes core physics courses and specialty

courses in space physics, aeronomy, magnetospheric and auroral physics, and advanced plasma physics. The specialty courses support graduate research with faculty members at UAF's Geophysical Institute and include areas such as numerical simulations and time-series analysis. Additional courses such as radiative transfer and physics of fluids provide added breadth.

Minimum Requirements for Physics Degrees: M.S.: 30-33 credits; Ph.D.: 18 thesis credits

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## PH.D., SPACE PHYSICS

Space physics focuses on the physics of upper atmospheres, ionospheres, magnetospheres and the interplanetary medium. It includes core physics courses and specialty courses in space physics, aeronomy, magnetospheric and auroral physics, and advanced plasma physics. The specialty courses support graduate research with faculty members at UAF's Geophysical Institute, and include areas such as numerical simulations and time-series analysis. Additional courses such as radiative transfer and physics of fluids provide added breadth.

Minimum Requirements for Space Physics Doctorate Degree: 18 thesis credits

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### College of Natural Science and Mathematics

Department of Physics (<https://www.uaf.edu/physics/>)  
907-474-7339

## Programs Degrees

- B.S., Physics (<https://catalog.uaf.edu/bachelors/physics-bs/>)
- M.S., Physics (<https://catalog.uaf.edu/masters/physics/>)
- M.S., Physics with concentration in Computational Physics (<https://catalog.uaf.edu/masters/physics-computational/>)
- M.S., Physics with concentration in Space Physics (<https://catalog.uaf.edu/masters/physics-space/>)
- Ph.D., Physics (<https://catalog.uaf.edu/phd/physics/>)
- Ph.D., Space Physics (<https://catalog.uaf.edu/phd/physics-space/>)

## Minor

- Minor, Physics (<https://catalog.uaf.edu/minors/physics/>)