

# PHYSICS

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

## M.S., M.A.T., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 – 33 credits;  
M.A.T.: 36 credits; Ph.D.: 18 thesis credits

The science of physics is concerned with the nature of matter and energy in 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 disciplines such as the biosciences and medicine.

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 investigations of auroral, ionospheric, magnetospheric and space plasma physics, the physics and chemistry of the upper and middle atmosphere, radio-wave propagation and scattering, solar-terrestrial relations, condensed matter physics, complex dynamics of non-linear systems, ice physics and infrasonics.

The physics department is also responsible for the graduate degree programs in general science, computational physics and space physics. These programs are also described in this catalog.

### Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete the thesis or non-thesis requirements:

#### Thesis

- a. Complete the following:  
PHYS F699—Thesis..... 6 – 12
- b. Complete four of the following:  
PHYS F611—Mathematical Physics I..... 3  
PHYS F612—Mathematical Physics II..... 3  
PHYS F621—Classical Mechanics..... 3  
PHYS F622—Statistical Mechanics..... 3  
PHYS F631—Electromagnetic Theory..... 3  
PHYS F632—Electromagnetic Theory..... 3  
PHYS F651—Quantum Mechanics..... 3  
PHYS F652—Quantum Mechanics..... 3
- c. Complete 12 credits from the following:  
Approved PHYS F600-level courses  
Approved ATM F600-level courses
- d. Minimum credits required..... 30

### Non-Thesis

- a. Complete the following:  
PHYS F698—Research..... 3 – 6  
Approved courses..... 18
- b. Complete four of the following:  
PHYS F611—Mathematical Physics I..... 3  
PHYS F612—Mathematical Physics II..... 3  
PHYS F621—Classical Mechanics..... 3  
PHYS F622—Statistical Mechanics..... 3  
PHYS F631—Electromagnetic Theory..... 3  
PHYS F632—Electromagnetic Theory..... 3  
PHYS F651—Quantum Mechanics..... 3  
PHYS F652—Quantum Mechanics..... 3
- c. Minimum credits required\*..... 33  
\* At least 30 credits must be regular course work.

### Graduate Program — M.A.T. Degree

1. Complete the general university requirements (page 202).
2. Complete the M.A.T. degree requirements (page 208).
3. Contact the department head for specific degree requirements.
4. Minimum credits required..... 36

### Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 202).
2. Complete the Ph.D. degree requirements (page 207).\*
3. Complete and pass a written and oral comprehensive examination.
4. Minimum credits required..... 18  
\* Complete in accordance with physics department's policies and procedures manual for graduate students.  
See General Science.  
See Physics, Computational.  
See Physics, Space.