

# Physics, Computational

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

## M.S. Degree

Minimum Requirements for Degree: 30–33 Credits

Computational modeling and simulations have become powerful tools in many science disciplines. For example, computational physics includes numerical modeling and computer simulations for physical processes in Earth's upper atmosphere and space environment, and for complex (non-linear) biological and physical systems.

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

## Graduate Program—M.S. Degree

1. Complete the following admissions requirements:
  - a. Complete a B.S. degree in physics.
  - b. Complete MATH 421 and 422.
2. Complete the general university requirements (page 176).
3. Complete the master's degree requirements (page 180).
4. Complete the thesis or non-thesis requirements:

### Thesis Option

- a. Complete the following
  - PHYS 611—Mathematical Physics I..... 3
  - PHYS 612—Mathematical Physics II..... 3
  - PHYS 629—Methods of Numerical Simulation in  
Fluids and Plasma ..... 3
  - PHYS 699—Thesis..... 6-12
- b. Complete approved PHYS 600-level courses..... 6
- c. Complete at least 3 credits from the following:
  - Approved MATH 600-level courses  
(excluding MATH/PHYS 611 and 612)..... 3
  - Approved CS 600-level courses..... 3
- d. Minimum credits required\* ..... 30

\* At least 24 credits must be from regular course work for thesis option.

### Non-Thesis Option

- a. Complete the following
  - PHYS 611—Mathematical Physics I..... 3
  - PHYS 612—Mathematical Physics II..... 3
  - PHYS 629—Methods of Numerical Simulation in  
Fluids and Plasma ..... 3
  - PHYS 698—Research..... 3-6
- b. Complete approved PHYS 600-level courses..... 9
- c. Complete at least 3 credits from the following:
  - Approved MATH 600-level courses  
(excluding MATH/PHYS 611 and 612)..... 3
  - Approved CS 600-level courses..... 3
- d. Minimum credits required\* ..... 33

\* At least 30 credits must be from regular course work for non-thesis option.

See Physics.

See Physics, Space.

Note: Page numbers refer to the UAF 2006-2007 academic catalog, which can be viewed online at [www.uaf.edu/catalog/](http://www.uaf.edu/catalog/).