

# MASTER OF SCIENCE IN PHYSICS

Students wishing to be admitted to the Master of Science in physics program should have completed an undergraduate major in physics, with a minimum 3.0 grade point average in physics and mathematics courses, and a minimum 3.0 GPA in their last 60 semester units. Students whose undergraduate degree is in another field may be admitted to conditionally classified status, but additional undergraduate-level coursework will be required to make up the deficiency. Contact the graduate coordinator for further details.

## Progress toward Degree

Classified or conditionally classified graduate students who do not successfully complete two courses per year toward their Advancement to Candidacy are subject to disqualification.

Graduate students are expected to attend colloquia and must attend at least five per semester unless excused by the graduate coordinator.

## Written English Proficiency Requirement

The University has a requirement for written English proficiency that is to be assessed at two levels.

### Level One (Prior to Admission)

Satisfied by obtaining a score of 4.5 or above in the analytical writing portion of the GRE. Applicants who do not receive a minimum score of 4.5 on the GRE may be admitted conditionally and must complete SCI 614 or SCI 560GW with a grade of B or better during the first year.

### Level Two

Satisfied by submitting a thesis which the thesis committee agrees meets the level two standard, or by submitting a paper of at least ten pages which the graduate coordinator agrees meets the level two standard.

## Examinations

The oral defense of the thesis is delivered to the student's advisory committee and includes responses to questions from the committee on subjects related to the thesis topic. The master's comprehensive oral examination (PHYS 896EXM) is delivered to the student's advisory committee and covers all areas of theoretical and experimental physics deemed appropriate by the committee. The oral defense of the thesis or the master's comprehensive oral examination may be repeated once, under conditions specified by the committee, upon petition by the student.

Prior to taking graduate courses numbered 700-799, M.S. students must pass a written examination on undergraduate-level physics. Those intending to concentrate in astronomy may also be separately tested on appropriate undergraduate-level material prior to taking astronomy courses numbered 700-799; testing will occur at the discretion of the graduate coordinator. The requirement may be satisfied by achieving a satisfactory score on the Physics Major Field Test or Physics GRE. While new graduate students may take graduate courses during their first semester with the department (in consultation with the graduate coordinator), they must pass this test before taking graduate courses in subsequent semesters. If a student fails to pass the test, they will be advised to take appropriate undergraduate courses to remedy those gaps that prevented them from passing the test. Tests taken more than six

months prior to enrollment as a graduate student in the department do not fulfill this requirement.

## Program Learning Outcomes

Upon completion of the Master of Science in Physics a student will demonstrate:

1. knowledge and understanding of, and ability to use, essential concepts and methods in physics.
2. strong ability to utilize mathematical relationships and methods to describe physical phenomena.
3. ability to solve problems of significant difficulty in physics by integrating conceptual understanding, quantitative understanding, logical reasoning, and use of mathematical methods.
4. strong ability to analyze and interpret data, with proper treatment of measurement uncertainties (lab/industry track only).
5. strong ability to design and implement experimental investigations, with proper use of instrumentation (lab/industry track only).
6. strong ability to communicate knowledge and results to others in written and oral form.
7. strong ability to utilize print and electronic resources, computers, and software to gain information and perform calculations.
8. ability to work in teams to solve a problem.

## Physics (M.S.) – Minimum 30 units

### Group I: Core Courses (15 units)

Code	Title	Units
PHYS 701	Classical Mechanics	3
PHYS 704	Electricity and Magnetism I	3
PHYS 706	Quantum Mechanics	3
PHYS 775	Statistical Physics	3
PHYS 785	Theoretical Physics	3

### Group II: Graduate Physics Electives (6 units)

Elective graduate physics or astronomy courses with numbers in the range from PHYS 700 - PHYS 790 and ASTR 700 - ASTR 798 only, (note that PHYS 800 - PHYS 899 do not count in this category).

### Group III: General Electives (6-9 units)

Elective advanced upper-division (numbered 400 or above) or graduate courses in physics, astronomy, or appropriately related subjects, selected on advisement and with approval of graduate coordinator (note that PHYS 800 - PHYS 899 count in this category). **\*Note:** Students who choose the Culminating Experience Exam (PHYS 896EXM - 0 units) will choose 9 units of General Electives. Students who choose the Master's Thesis (3 units) will choose 6 units of General Electives.

### Group IV: Thesis and/or Oral Examination \*(0-3 units)

Code	Title	Units
PHYS 896EXM	Culminating Experience Examination	0
or		
PHYS 898	Master's Thesis (and Oral Defense of Thesis)	3

**Note:** Degree total to include no more than 6 units of PHYS 800 - PHYS 899, nor more than 4 units of PHYS 730.