

PHYSICS (M.S.)

Master of Science. Major in Physics. (Non-thesis Option)

General M.S. non-thesis requirements apply.

The requirement is a minimum of 30 credits in coursework and the credits must be distributed as follows:

Code	Title	Hours
Physics Courses Numbered 500 and higher ¹		20
Courses Numbered 400 and higher ²		10
Required Courses ³		
PHYS 521	Advanced Mechanics	
PHYS 533	Statistical Mechanics	
PHYS 541	Electromagnetic Theory I	
PHYS 542	Electromagnetic Theory II	
PHYS 550	Quantum Mechanics I	
Total Hours		30

Courses to total 30 credits for this degree

¹

Include 2 credits for PHYS 501 Seminar and no more than three credits from PHYS 599 Research.

²

These may be non-physics courses upon the approval of the Physics Department's Academic Standards Committee.

³

Included in the 30 minimum credits.

Students must pass a comprehensive examination, which must be taken at the first offering after the student has completed the core courses required for the M.S. degree. Full-time students may not delay the completion of their core course requirements by avoiding the taking of a core course when offered except with the prior written consent of the Academic Standards Committee and the student's major professor. The examination is written and covers all of general graduate-level physics as defined by the required courses for the M.S. degree. Typically, it will be administered on two different days, with a time limit of approximately three hours for each day. The results of the examination will be evaluated by the physics faculty. If the comprehensive examination is failed, it may be repeated only once; the repeat examination must be taken within a period of not less than three nor more than 14 months following the first attempt.

Master of Science. Major in Physics. (Thesis Option)

General M.S. requirements for a degree with thesis apply. The student must complete a total of at least 30 credits at 400-level or higher, 20 of which must be at the graduate level, including a maximum of 10 credits in research and thesis, with no more than three of these credits from PHYS 599. Specific departmental graduate course requirements are 2 credits in PHYS 501 and PHYS 521, PHYS 541, PHYS 542 and PHYS 550. If a student's undergraduate preparation is considered deficient (e.g., it lacks laboratory experience at the upper-division level), then certain undergraduate

courses will be required in the study plan. Such remedial credits are not to be counted towards the total required for the degree. No departmental comprehensive exam is required.

A final defense of the M.S. thesis is scheduled upon completion of the thesis. The candidate is required to defend their work and show a satisfactory knowledge of the field in which the thesis research has been performed. The defense is oral and would typically last for one hour. The exam has to be announced to the physics faculty at least one week in advance. All members of the physics faculty are permitted to attend and ask questions. A recommendation of a majority of the student's graduate committee is necessary to pass the defense. If the defense is failed, it may be repeated only once; the repeat defense must be taken within a period of not less than three months nor more than one year following the first attempt.

A typical study plan would include 40 to 50 credits of coursework at the 500-level in physics and about 30 credits in research and thesis. The study plan also would include at least six units of upper-division or graduate coursework outside of physics. The nature and number of these additional units will depend upon the professional goals of the individual student. In planning a program, the student should consult with the departmental Academic Standards Committee for approval of any particular choice of non-physics course work. The Ph.D. degree in physics is primarily a recognition of ability and accomplishment in research. The purpose of the coursework is to provide the factual and theoretical background for research. Successful completion of coursework is not in itself considered as completion of the major requirement for the degree.

All Ph.D. graduate students are required to enroll in Seminar each semester while in residence.

No formal foreign language requirement exists for Ph.D. candidates; however, in individual cases, depending on the research topic, a reading knowledge in one foreign language may be required by the thesis advisor.

A two-part preliminary examination is required. Part I is taken after the student has completed the courses required for the Ph.D. degree. Full-time students must take this exam no later than 2 years after entering the Ph.D. program. Students who have earned a master's degree in physics or wish to transfer credits to satisfy any of the departmental requirements (PHYS 521, PHYS 533, PHYS 541, PHYS 542, PHYS 550, PHYS 551, PHYS 571) may be required by the Academic Standards Committee to take the exam earlier. The examination is written and covers all of general graduate-level physics as defined by the required courses for a Ph.D. degree. Typically, it will be administered on two different days, with a time limit of approximately five hours for each day. The results of the examination will be evaluated by the physics faculty. If the preliminary examination, Part I, is failed, it may be repeated only once; the repeat examination must be taken within a period of not less than three months nor more than 14 months following the first attempt.

Part II of the preliminary examination is set by the major professor of the Ph.D. student for a date within the second semester after Part I has been passed. The student is required to explain the goals of their planned Ph.D. research to the thesis committee and show general familiarity with the fields relevant for the research. Part II is oral and typically lasts for one hour. The exam is to be announced to the physics faculty at least one week in advance. All members of the physics faculty are permitted to attend and ask questions. The student's committee certifies to the Graduate College the results of the preliminary examinations. Upon passing, the student is advanced to candidacy for the Ph.D. degree. If Part II is failed, it may be repeated only once; the repeat examination

must be taken within a period of not less than three months nor more than one year following the first attempt.

A final defense of the Ph.D. thesis is scheduled upon completion of the dissertation. The candidate is required to defend their work and show a superior knowledge of the field in which the thesis research has been performed. The defense is oral and typically lasts for one hour. The exam is to be announced to the physics faculty at least one week in advance. All members of the physics faculty are permitted to attend and ask questions. A recommendation of a majority of the student's graduate committee is necessary to pass the defense. If the defense is failed, it may be repeated only once; the repeat defense must be taken within a period of not less than three months nor more than one year following the first attempt.

1. Students are able to present their research in a clear and organized fashion at conferences and colloquia.
2. Students acquire the ability to partake in the conception and execution of a meaningful research project.
3. Students acquire advanced knowledge through upper-level course work and the completion of a meaningful research project (thesis option).