

PHYSICS (MS, PHD)

The Department of Physics offers two graduate degrees: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.). The M.S. degree is aimed at students pursuing careers in industry, state or federal government or science/physics education. The M.S. in Physics may be either a completely coursework based degree or it may have a thesis component as described later. The Ph.D. in Physics prepares students for research and teaching careers in physics and engineering disciplines, including research and leadership positions with non-profit organizations, industry, universities, private foundations, and state or federal government agencies.

Master of Science in Physics

Students follow an individual plan of study arranged jointly by the student and an advisory committee, based on the student's career goals as well as prior preparation. Candidates for the master's degree without thesis are required to complete 30 credits of courses. Candidates for the master's degree with thesis are required to complete 21 credits of courses and nine credits of thesis research, as stipulated in the Academic Regulations of this catalog.

Master of Science without Thesis Course Requirements

Course	Title	Credits
PHYS 5101	Methods of Theoretical Physics I	3
PHYS 5201	Theoretical Mechanics I	3
PHYS 5301	Electrodynamics I	3
PHYS 5401	Quantum Mechanics I	3
PHYS 5402	Quantum Mechanics II	3
PHYS 5500	Statistical Mechanics	3
The remaining 12 credits could be 5000 or higher level courses from Physics, Mathematics, Biology, Chemistry, or College of Engineering.		12
Total Credits		30

Master of Science with Thesis Research Course Requirements

Course	Title	Credits
PHYS 5101	Methods of Theoretical Physics I	3
PHYS 5201	Theoretical Mechanics I	3
PHYS 5301	Electrodynamics I	3
PHYS 5401	Quantum Mechanics I	3
PHYS 5402	Quantum Mechanics II	3
PHYS 5500	Statistical Mechanics	3
GRAD 5950	Master's Thesis Research	9
The remaining three credits could be 5000 or higher level courses from Physics, Mathematics, Biology, Chemistry or College of Engineering		3
Total Credits		30

Doctor of Philosophy in Physics Course Requirements

PHYS 5302 Electrodynamics II and PHYS 5403 Quantum Mechanics III. The rest of the credits necessary for a Ph.D. (on the Plan of Study) are determined by the student's advisory committee. These credits could

be 5000 or higher level courses from Physics, Mathematics, Biology, Chemistry or College of Engineering.

General Examination

Oral examination, short (~30 minutes) oral presentation on a research topic chosen in consultation between the student and their advisory committee, followed by an oral exam probing the student's physics knowledge underlying their presentation. Students must satisfy the core coursework requirement before taking the Ph.D. General Examination (i.e. obtain a grade of B or better in four courses from the core course list). The general examination committee consists of the student's three-person advisory committee, plus two other faculty members from a different research field.

Dissertation Proposal

By the end of their third year, all Ph.D. students must have an Advisory Committee and must complete their Dissertation Proposal (details and form at the Graduate School website). The written proposal must be approved by the student's Advisory Committee, including an oral defense of the proposal before a committee composed of their Advisory Committee and two other faculty examiners.

Additional General Requirements

In addition, the following requirements apply to all students entering the Physics graduate program. Each year, each student must complete, in consultation with their faculty advisor, a Physics Graduate Student Progress Form. A Plan of Study must be completed by M.S. students no later than the beginning of the final semester, and for Ph.D. students no later than when 18 credits of course-work have been completed. All Physics graduate students are expected to attend the Departmental Colloquium, and to participate in the regular research seminars in the department. A Safety Examination is required of all graduate students; a Shop Course is required for use of the Physics Machine Shop, and Laser Safety Training for students using lasers. All beginning graduate students are required to attend the Computer Information Workshop and Orientation on Computer Use and Security. There is no foreign language requirement for the Physics M.S. and Ph.D. degrees.