

# PHYSICS (PH.D.)

For some students, the master's degree will be used as part of a continuing Ph.D. program; for others, it will be a terminal degree leading to employment in government laboratories, industrial programs, hospitals, teaching positions, and other occupations. The Master of Science with a Major in Physics is offered under Plan A or Plan C.

## Admission Requirements

Admission to this program is contingent upon admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>). In addition, applicants must satisfy the following criteria.

## Prerequisite Preparation

Prerequisite preparation should include:

Code	Title	Credits
A minimum of general college physics with laboratory equivalent to:		
PHY 2170	University Physics I for Scientists and Engineers	
PHY 2180	University Physics II for Scientists and Engineers	
PHY 3300	Introductory Modern Physics	

Fifteen credits in intermediate physics courses, for example, those equivalent to the following:

PHY 5100	Methods of Theoretical Physics I	
PHY 5200	Classical Mechanics I	
PHY 5210	Classical Mechanics II	
PHY 5340	Optics	
PHY 6400	Quantum Physics I	
PHY 6410	Quantum Physics II	
PHY 6500	Thermodynamics and Statistical Physics	
PHY 6600	Electromagnetic Fields I	
PHY 6610	Electromagnetic Fields II	
PHY 6850	Modern Physics Laboratory	

Mathematics equivalent to mathematics prerequisites required in those physics courses

A minimum of general college chemistry with laboratory equivalent to:

CHM 1100 & CHM 1130	General Chemistry I and General Chemistry I Laboratory	
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The Graduate Record Examination, both the General section and the Physics subject test, is strongly recommended as a counseling aid in preparing the student's plan of study.

## Program Requirements

Candidates for the doctoral degree must complete 60 credits beyond the baccalaureate, including 18 credits of dissertation research. Students must demonstrate proficiency in the fields of mechanics, electromagnetic theory, quantum physics, and thermodynamics and statistical mechanics.

### Course work:

Code	Title	Credits
The following courses or their equivalent will be required of all candidates:		
PHY 7110	Methods of Theoretical Physics II	
PHY 7400	Quantum Mechanics I	
PHY 7500	Statistical Mechanics	

One of the survey courses: 3

PHY 7050	Survey of Condensed Matter Physics	
PHY 7060	Survey of Elementary Particle Physics	
PHY 7070	Survey of Nuclear Physics	
PHY 7080	Survey of Astrophysics	
PHY 7090	Survey of Biophysics	

Plus at least two additional courses numbered above 7000. 6

The remainder of the 42 credits are fulfilled with any combination of graduate-approved courses including seminar, colloquium, directed study, and research in physics.

In general, it is recommended that students take all the advanced courses in their specialty. Students specializing in any branch of theoretical physics are encouraged to take the quantum theory of fields, or a related directed study. On petition of the student and his/her dissertation advisor, the Departmental Graduate Committee may waive any of the above course requirements.

**Ph.D. Qualifying Examination:** This will normally be taken after the student has completed approximately one year of graduate course work. Its purpose is to investigate the student's knowledge of physics and capacity for creative thought. This is a written examination. The student must submit a Plan of Work prior to taking this examination.

**Physics Colloquium (PHY 8995):** It is recommended that all full-time graduate students register for and attend the Departmental Physics Colloquium each semester they are in residence.

**Dissertation:** An approved dissertation is required. The 18 credit dissertation registration requirement is fulfilled by registering for the courses PHY 9991 and PHY 9992 (Doctoral Dissertation Research and Direction I and II, respectively), in consecutive academic year semesters.

**Academic Scholarship:** All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the College of Liberal Arts and Sciences (<http://bulletins.wayne.edu/graduate/college-liberal-arts-sciences/academic-regulations/>).