

PHYSICS PHD

Degree Requirements

The following requirements are in addition to, or further elaborate upon, those requirements outlined in The Graduate School Policy Guide (<https://catalogs.northwestern.edu/tgs/academic-policies-procedures/>).

MS Degree Requirements for PhD Students

Students enrolled in the Ph.D. program have the opportunity to obtain a formal master's degree as they work toward completion of the Ph.D. These requirements are as follows:

- Completion of seven core courses in the first year
- Completion of five or more elective courses in the second year
- GPA of 3.0 or higher

PhD

Total Units Required: 13

(All but electives are required for the MS degree.)

Course	Title
Core Courses	
PHYSICS 411-0	Classical Mechanics
PHYSICS 412-1 & PHYSICS 412-2 & PHYSICS 412-3	Quantum Mech and Quantum Mechanics and Quantum Mechanics
PHYSICS 414-1 & PHYSICS 414-2	Electrodynamics and Electrodynamics
PHYSICS 416-0	Introduction to Statistical Mechanics
Elective Courses	
PHYSICS 411-1	Methods of Theoretical Physics
PHYSICS 420-0	Statistical Physics
PHYSICS 421-0 & PHYSICS 422-2 & PHYSICS 422-3	Introduction to Superconductivity and Condensed-Matter Physics and Condensed-Matter Physics
PHYSICS 424-1	Particle Physics
PHYSICS 426-0	Nonlinear Optics
PHYSICS 427-0	Quantum Optics
PHYSICS 428-1 & PHYSICS 428-2 & PHYSICS 428-3	Quantum Field Theory and Quantum Field Theory and Relativistic Quantum Field Theory
PHYSICS 430-0	Nonlinear Dynamics & Chaos
PHYSICS 432-1 & PHYSICS 432-2	Many-Body Theory and Many-Body Theory
PHYSICS 434-0	Quantum Fluids, Solids, and Gases
PHYSICS 435-0	Soft Matter Physics
PHYSICS 436-0	Mesoscopic and Nanometer Scale Physics
PHYSICS 440-0	Advanced Topics in Nuclear Physics
PHYSICS 441-0	Statistical Methods for Physicists and Astronomers
PHYSICS 442-0	Advanced Topics in Particle Physics
PHYSICS 445-1 & PHYSICS 445-2	General Relativity and General Relativity
PHYSICS 450-0	Advanced Topics in Condensed Matter
PHYSICS 460-0	Advanced Topics in Statistical Physics
PHYSICS 465-0	Advanced Topics in Nonlinear Dynamics
PHYSICS 470-0	Introduction to Biological Physics: From Molecules to Cells (IBiS 410)

PHYSICS 480-0

Advanced Topics in Atomic, Molecular, and Optical
Physics

Other PhD Degree Requirements

- Examinations:** There is no longer a written qualifying exam. Should a student's grades in the core courses fall below a 3.0, the student will be required to sit for an oral qualifier with a chosen committee.
- Research/Projects:** original research project of publishable quality
- PhD Dissertation:** none specified beyond the PhD degree requirements outlined in the Current Students section of the web site
- Final Evaluations:** none specified beyond the PhD degree requirements outlined in the Current Students section of the web site