

# M.S. in Physics

The Department of Physics grants the Master of Science Degree under two options: Plan-A (thesis required), and Plan-B (without thesis).

## Plan-A Requirements

### Coursework

PHSX 594	Seminar (01 - Teaching Seminar)	1
PHSX 594	Seminar (15 - Research Introduction Seminar)	1
PHSX 501	Mathematical Methods and Their Applications in Classical Mechanics	3
PHSX 506	Quantum Mechanics I	3
PHSX 519	Mathematical Methods and Their Applications in Electromagnetic Theory	3
PHSX 535	Statistical Mechanics	3
Electives (see electives)		6

### Thesis

PHSX 590	Master's Thesis (An acceptable thesis and at least 10 credits of this course are required)	10
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### Examination

Qualifying and Comprehensive Examinations are required. A Final Oral Defense of the thesis is also required.

**Total Credits** 30

## Plan-B Requirements

### Coursework

A minimum of 30 credits of acceptable course work is required, which shall be distributed as follows:

PHSX 594	Seminar (01 -Teaching Seminar)	1
PHSX 594	Seminar (15 -Research Introduction Seminar)	1
PHSX 501	Mathematical Methods and Their Applications in Classical Mechanics	3
PHSX 506	Quantum Mechanics I	3
PHSX 519	Mathematical Methods and Their Applications in Electromagnetic Theory	3
PHSX 520 or ASTR 550	Electromagnetic Theory II Radiative Processes in Astrophysics	3
PHSX 535	Statistical Mechanics	3
Electives (see electives)		13

### Thesis

None Required

### Examinations

Qualifying and comprehensive exams are required. The comprehensive exam for Plan B involves a review of the student's coursework performance in the five required core physics courses by the student's degree committee.

**Total Credits** 30

## Examinations

- A student attempting to obtain the M.S. degree under Plan B must pass the Qualifying Examination at the M.S. level. A student who has passed the Qualifying Exam at the Ph.D. level will be deemed to have passed the M.S. Qualifying Examination.
- The Comprehensive Exam for M.S. degree-seeking graduate students under Plan B is based on the student's aggregate performance in the five core physics courses. Passing this Comprehensive Exam fulfills the Comprehensive Examination requirement of the Graduate School for

a master's degree and is subject to all conditions and requirements set forth by the official policies of the Graduate School.

- Passing the Physics Comprehensive Examination covering the thesis and related areas fulfills the Comprehensive Examination requirement of the Graduate School for M.S. degree-seeking graduate students under Plan A.
- Details concerning the Physics Qualifying Comprehensive Examination and the Physics Comprehensive Candidacy Examination can be found at <http://www.physics.montana.edu/grad/>

Details on Physics graduate programs, application process, and degree requirements can be found at: Physics Graduate Program Overview (<http://www.physics.montana.edu/grad/>) and in the Physics graduate manual that is accessible from the Physics Department Home page <https://physics.montana.edu/>.

**Required Examinations:** Qualifying and Comprehensive Examinations are required. A Final oral defense of the thesis is also required for Plan A. For details, see the Physics graduate manual that is accessible from the Physics Department Home page <https://physics.montana.edu/>.

**Qualifying exam:** The Qualifying exam assesses proficiency in Physics at the undergraduate level and preparedness for graduate study and MS-level research. The Qualifying Exam consists of problems drawn from upper-level undergraduate course work in four subject areas: quantum mechanics, electricity and magnetism, classical mechanics, and statistical mechanics and thermodynamics. The Qualifying Exam is given twice a year, once in August and once in January. Students first take the Qualifying Exam at the beginning of their first year and are required to pass by January of their second year. To pass the Qualifying Exam at the MS level, a student must receive a passing grade in each of three of the four subjects. Students can pass individual subjects on different attempts and culminate a complete pass in up to four attempts. Entering students are highly encouraged to study for the exam the summer before entering, with the goal of passing all four subjects in their first two attempts and starting their research work in the Spring/Summer of their first year of graduate school.

**Comprehensive Exam:** The Comprehensive Exam for M.S. degree-seeking graduate students is based on the student's aggregate performance in the six core physics courses, not a written exam. Passing this Comprehensive Exam fulfills the Comprehensive Examination requirement of the Graduate School for a master's degree.

**Thesis Defense:** For Plan A M.S. degrees, a final oral examination is conducted by the student's Graduate Committee to assess the research contributions of the student. The passing of this Thesis Defense fulfills the Defense of Thesis requirement of the Graduate School for a master's degree.