

Physics, MS

There are three M.S. options in physics:

- Thesis
- Non-thesis
- Secondary Education Certification

Required core courses for each are:

Code	Title	Semester Hours
PH 601	CLASSICAL DYNAMICS I	3
PH 607	MATHEMATICAL METHODS I	3
PH 609	MATHEMATICAL METHODS II	3
PH 621	STAT MECH KINETIC THRY I	3
PH 631	ELECTROMAGNETIC THEORY I	3
PH 651	QUANTUM MECHANICS I	3
PH 652	QUANTUM MECHANICS II	3
PH 792	PHYSICS SEMINAR (two semesters) ¹	1
PH 792	PHYSICS SEMINAR	1
Total Semester Hours		23

¹ All M.S. students are required to complete two semesters of PH 792 with a grade of "S"; these semester hours do not, however, count toward minimum degree requirements given below.

Students should complete a Program of Study with the help of their faculty advisor before the completion of 12 semester hours of graduate coursework. A Program of Study is a detailed list of courses that the student will take to satisfy the appropriate degree requirements.

M.S. with Thesis

A student must take at least 24 semester hours in graduate courses, plus at least 6 semester hours of PH 699, culminating in the successful defense of their thesis. Students writing a thesis do not need to take the Comprehensive Examination.

Optics and Photonics Technology Curriculum

The OPT (PH) M.S. degree program is comprised of a minimum of 27 semester hours of graduate coursework, plus a minimum of 6 semester hours of PH 699. The thesis option is the only available route to the OPT degree. Students may pursue the OPT option through either the Physics Department (PH) or the Electrical & Computer Engineering Department (ECE). The OPT (PH) program of study, available on the Department website <http://physics.uah.edu>, meets the Department of Physics M.S. degree requirements and is suggested for students coming from a Physics background. Students in this category, having a Physics Department faculty member as an advisor, will be designated as having Physics as their "home" department. Courses have been chosen such that little or no prior graduate work in physics is required. The OPT degree program does not prepare the student for taking the Physics Comprehensive Exam or the OSE Preliminary Exam. Requirements for students seeking the OPT degree through the Electrical Engineering department, OPT (ECE), may be significantly different.

M.S. without Thesis

A student must take at least 33 semester hours of graduate coursework, and achieve an M.S. passing grade on the Comprehensive Examination. This exam is offered every August, and also serves as the preliminary examination for the Ph.D. degree program. The Comprehensive Examination is on material covered in the core courses given above, and thus has sections dealing with quantum mechanics, electromagnetic theory and relativity and classical and statistical mechanics. Criteria for an M.S. or Ph.D. pass are given on the Department's web site.

For students in the Optical Science and Engineering (OSE) Ph.D. program who desire an M.S. degree in Physics, a passing grade on the OSE Preliminary Examination is an acceptable substitute for the Comprehensive Examination.

A full-time course schedule leading to the Comprehensive Exam at the start of the Fall semester of the second year is listed below.

Year 1		Semester Hours
Fall		
PH 607	MATHEMATICAL METHODS I	3
PH 651	QUANTUM MECHANICS I	3

PH 601	CLASSICAL DYNAMICS I	3
PH 792	PHYSICS SEMINAR	1
Term Semester Hours:		10
Spring		
PH 609	MATHEMATICAL METHODS II	3
PH 652	QUANTUM MECHANICS II	3
PH 631	ELECTROMAGNETIC THEORY I	3
PH 792	PHYSICS SEMINAR	1
Term Semester Hours:		10
Summer		
PH 621	STAT MECH KINETIC THRY I	3
Elective		3
Term Semester Hours:		6
Total Semester Hours:		26

Nine (9) Remaining Semester Hours

The remaining 9 semester hours of graduate coursework can be taken in the Physics Department (for advanced study in optics, space physics, astrophysics, or planetary science) or from another department such as Atmospheric Science. Students need to consult with their advisor regarding the selection of topical elective courses.

M.S. with Certification

With this option, also called the *Alternative Fifth-year Program* in the College of Education section of the Graduate Catalog, students are awarded an M.S. degree in Physics as well as Class A (Master's level) Teaching Certification by the State of Alabama. **We strongly encourage students to investigate this rewarding career option.**

This program is available to students who do not already have a Class B (baccalaureate level) Teaching Certification. Requirements are 27 graduate semester hours in Education courses and 24 graduate semester hours in Physics courses. The Education courses are specified in the College of Education section of this catalog, and include a high school internship. The Physics courses include the core courses above, plus 9 additional semester hours. Three of the 9 additional hours will be PH 679 the required Capstone Course for this M.S. option. Neither the Comprehensive Exam nor a thesis is required for this option. However, a thesis can replace the Capstone Course, if desired.