

# Physics and Astronomy

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Graduate study is offered in the Department of Physics and Astronomy leading to the degrees of Master of Science in Physics and to the Doctor of Philosophy in Physics. Both thesis and non-thesis options are offered for the Master of Science. An interdisciplinary program leading to the degree of Doctor of Philosophy in Engineering with a concentration in Applied Physics is available. A specific program, depending on the research interest of the student, is established by consultation between the student and his/her advisor. The non-thesis M.S. option provides a means of enabling the Ph.D.-track student to complete graduate education in a timely manner.

Major areas of study include the following:

Astrochemistry

Astrophysics

Computational Physics

Condensed matter physics

Experimental and theoretical nuclear physics

Experimental and theoretical optics

Experimental atomic, molecular, optical, and plasma physics

Experimental nanomaterials and nanoelectronics

Graduate research and teaching assistantships are available.

## Admission Criteria

TOEFL and IELTS scores are used following the General Requirements for Admission by the University.

## Provisional Admission

An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's program of study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student **shall** be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. **While in the provisional status, a student is not eligible to hold a graduate assistantship.**

## Academic Performance

A candidate for a degree must average B or higher on all graduate courses attempted after admission to the program. No grade under C will be accepted on the program of study, and no more than 8 credit hours of C grades can be earned. With the approval of the graduate coordinator and the college dean, a student may retake one course per degree, except for those approved for repeated credit (e.g. special topics, individual studies, thesis, dissertation, etc.). Both courses will remain on the permanent transcript, and both grades will be included in the GPA computation. Repeated courses must be taken at Mississippi State University. No additional program credit hours will be generated from a repeated course.

## Master of Science in Physics - Thesis

### Required Courses

|                              |                                   |   |
|------------------------------|-----------------------------------|---|
| PH 8233                      | Methods of Theoretical Physics I  | 3 |
| PH 8743                      | Quantum Mechanics I               | 3 |
| Select two of the following: |                                   | 6 |
| PH 8243                      | Methods of Theoretical Physics II |   |
| PH 8213                      | Mechanics                         |   |
| PH 8313                      | Electromagnetic Theory            |   |

|                         |                     |           |
|-------------------------|---------------------|-----------|
| <b>Other coursework</b> |                     | <b>12</b> |
| <b>Thesis</b>           |                     | <b>6</b>  |
| PH 9000                 | Research in Physics |           |
| <b>Total Hours</b>      |                     | <b>30</b> |

A thesis is required.

## Master of Science in Physics - Non-Thesis

|                         |                                   |           |
|-------------------------|-----------------------------------|-----------|
| <b>Required Courses</b> |                                   |           |
| PH 8213                 | Mechanics                         | 3         |
| PH 8233                 | Methods of Theoretical Physics I  | 3         |
| PH 8243                 | Methods of Theoretical Physics II | 3         |
| PH 8313                 | Electromagnetic Theory            | 3         |
| PH 8743                 | Quantum Mechanics I               | 3         |
| PH 8753                 | Quantum Mechanics II              | 3         |
| <b>Other coursework</b> |                                   | <b>12</b> |
| <b>Total Hours</b>      |                                   | <b>30</b> |

Students must pass the comprehensive examination as described below for Ph.D. candidates.

## Doctor of Philosophy in Physics

All Ph.D. candidates are required to take a minimum of 20 credit hours of PH 9000 Research/Dissertation. The committee for an individual student may require additional courses depending on the research area and background of the student. Ph.D. candidates must pass a comprehensive examination on their proposed dissertation topic. The comprehensive examination is comprised of a written document and an oral examination and must be attempted within the first 36 months of enrolling in the Ph.D. program.