

# PHYSICS (M.S.)

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	

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

The Master of Science degree in Physics is offered in three concentrations and under Plans A (Thesis), B (Essay) and C (Courses only). In all cases, 32 total credits are required to graduate. Specific requirements are based on concentration:

- Advanced Physics (p. 1)
- Biomedical Physics (p. 2)
- Applied Physics (p. 2)

## Advanced Physics Concentration

Code	Title	Credits
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The following physics courses or their equivalents must be completed or must have been completed previously at the undergraduate level. If these courses have not been taken previously and are taken at the graduate level, they can be counted towards the required credits for the degree.

PHY 6400	Quantum Physics I	
PHY 6500	Thermodynamics and Statistical Physics	
PHY 6600	Electromagnetic Fields I	
PHY 6860	Computational Physics	
	or PHY 6750 Applied Computational Methods	
Mathematics equivalent to mathematics prerequisites required for the course work listed above.		
PHY 7850	Data Analysis Techniques	3
PHY 6995	Professional Development Seminar in Physics	2

At least six credits of coursework in physics or astronomy at the 7000 level or above (exclusive of PHY 7990, PHY 7996, PHY 7999, PHY 8991, PHY 8995).

Other graduate courses can be taken at the 5000 level or above and can include up to 4 credits of PHY 7990, PHY 7999, PHY 8991, or PHY 8995. Courses in departments other than physics and astronomy can be taken with permission of the graduate director.

Plan A (plan-specific requirements)

PHY 8999	Master's Thesis Research and Direction (8 credits required)	
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A departmental final oral examination is required of all candidates.

Plan B (plan-specific requirements)

Three additional credits in physics at the 7000 level and above.

PHY 7999	Master's Essay Direction (3 credits required)	
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A departmental final oral examination is required of all candidates.

Plan C (plan-specific requirements)

Three additional credits in physics at the 7000 level and above.

## Biomedical Physics Concentration

Code	Title	Credits
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The following physics courses or their equivalents must be completed or must have been completed previously at the undergraduate level. If these courses have not been taken previously and are taken at the graduate level, they can be counted towards the required credits for the degree.

PHY 5750	Biological Physics	
ROC 6710	Physics in Medicine	
PHY 6750	Applied Computational Methods	
	or PHY 6860 Computational Physics	

Mathematics equivalent to mathematics prerequisites required for the course work listed above.

PHY 7850	Data Analysis Techniques	3
PHY 6995	Professional Development Seminar in Physics	2
PHY 7090	Survey of Biophysics (if students have taken PHY 6090 as an undergraduate student, another 7000 level course in physics and astronomy, such as PHY 7560)	3
PSL 7215	Nanobioscience	3

At least three nine credits of graduate coursework in physics and astronomy at the 7000 level or above (exclusive of PHY 7990, PHY 7996, PHY 7999, PHY 8995, PHY 8991, PHY 8999 and equivalent courses taken as an undergraduate student).

Other graduate courses can be taken at the 5000 level or above and can include up to 4 credits of PHY 7990, PHY 7999, PHY 8991, PHY 8995. Courses in departments other than physics and astronomy can be taken with permission of the graduate director.

#### Plan A (plan-specific requirements)

PHY 8999      Master's Thesis Research and Direction (8 credits required)

A departmental final oral examination is required of all candidates.

#### Plan B (plan-specific requirements)

PHY 7999      Master's Essay Direction (3 credits required)

A departmental final oral examination is required of all candidates.

## Applied Physics Concentration

Code	Title	Credits
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The following physics courses or their equivalents must be completed or must have been completed previously at the undergraduate level. If these courses have not been taken previously and are taken at the graduate level, they can be counted towards the required credits for the degree.

PHY 6500	Thermodynamics and Statistical Physics
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PHY 6600	Electromagnetic Fields I
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PHY 6860	Computational Physics or PHY 6750 Applied Computational Methods
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Mathematics equivalent to mathematics prerequisites required for the course work listed above.

PHY 7850	Data Analysis Techniques	3
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PHY 6995	Professional Development Seminar in Physics	2
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PHY 6450	Introduction to Material and Device Characterizations	4
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PHY 7050	Survey of Condensed Matter Physics	3
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At least three credits of coursework in physics or astronomy at the 7000 level or above (exclusive of PHY 7990, PHY 7996, PHY 7999, PHY 8991, PHY 8995).

Other graduate courses can be taken at the 5000 level or above and can include up to 4 credits of PHY 7990, PHY 7999, PHY 8991, PHY 8995. Courses in departments other than physics and astronomy can be taken with permission of the graduate director.

#### Plan A (plan-specific requirements)

PHY 8999      Master's Thesis Research and Direction (8 credits required)

A departmental final oral examination is required of all candidates.

#### Plan B (plan-specific requirements)

PHY 7999      Master's Essay Direction (3 credits required)

A departmental final oral examination is required of all candidates.