

# Physics and Philosophy, BS

The combined major in physics and philosophy provides a strong foundation in classical and modern physics, including studies of the various physical phenomena including electromagnetism, dynamics, building blocks of matter, energy, and radiation. It also provides students with an understanding of the methods and traditions of philosophical thought, as well as with opportunities to critically and collaboratively reflect on the nature of the world and the human situation in it. Students will be able to describe the method by which physical “law” is made manifest in the sciences, how this knowledge compares with other epistemological models studied in other contexts, and philosophical views on the status and source of physical “law.”

## Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

## Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (<http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/>).

## NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (<http://catalog.northeastern.edu/undergraduate/university-academics/nupath/>).

## Physics Major Requirements

Code	Title	Hours
<b>Introductory Physics</b>		
<i>Physics 1</i>		
Complete one of the following:		5
PHYS 1161 and PHYS 1162	Physics 1 and Lab for PHYS 1161	
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	
<i>Physics 2</i>		
Complete one of the following:		5
PHYS 1165 and PHYS 1166	Physics 2 and Lab for PHYS 1165	
PHYS 1155 and PHYS 1156 and PHYS 1157	Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155	
<b>Intermediate Physics</b>		
PHYS 2303	Modern Physics	4
PHYS 2371 and PHYS 2372	Electronics and Lab for PHYS 2371	4
<b>Advanced Physics</b>		
PHYS 3600	Advanced Physics Laboratory	4
PHYS 3602	Electricity and Magnetism 1	4
PHYS 4115	Quantum Mechanics	4
PHYS 4305	Thermodynamics and Statistical Mechanics	4
<b>Physics Elective</b>		
Complete one of the following:		4
MATH 4606	Mathematical and Computational Methods for Physics	
PHYS 4621	Biological Physics 1	
PHYS 4623	Medical Physics	
PHYS 4651	Medical Physics Seminar 1	
PHYS 4652	Medical Physics Seminar 2	
PHYS 5113	Particle Physics	

PHYS 5116	Network Science 1	
PHYS 5260	Introduction to Nanoscience and Nanotechnology	

## Philosophy Major Requirements

Code	Title	Hours
<b>Philosophy Required Courses</b>		
PHIL 1115	Introduction to Logic	4
PHIL 2325	Ancient Philosophy and Political Thought	4
or POLS 2325	Ancient Philosophy and Political Thought	
PHIL 2330	Modern Philosophy	4
PHIL 4500	Theory of Knowledge	4
or PHIL 3050	Information and Uncertainty	
<b>Advanced Philosophy Electives</b>		
Complete three PHIL courses with a designation of 3000 or above not used to satisfy another requirement, and at least one at 4000 or 5000 level.		12
<b>Critical Philosophy Elective</b>		
Take one of the following courses not used to fulfill another requirements:		4
AFAM 1101	Introduction to African American and Africana Studies	
PHIL 1104	Goddesses, Witches, Saints, and Sinners: Women and Religion	
PHIL 1271	Sex in Judaism, Christianity, and Islam	
PHIL 2155	Human Rights	
PHIL 2492	Indigenous Philosophy	
PHIL 2619	Race and Religion in Film	
PHIL 3500	Sexuality, Gender, and the Law	
PHIL 3822	Philosophy of Race and Racism	
<b>Philosophy Electives</b>		<b>8</b>
Complete two additional PHIL courses not used to satisfy other requirements.		8

## Physics/Philosophy Integrative Requirements

Code	Title	Hours
<b>Integrative Course Requirements</b>		
PHIL 4510	Philosophy of Science	4
or PHIL 3360	Scientific Approaches to Philosophy	
PHYS 3601	Classical Dynamics	4

## Breadth Courses

Code	Title	Hours
<b>Mathematics</b>		
MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4
MATH 2321	Calculus 3 for Science and Engineering	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4

## Physics and Philosophy Major Credit Requirement

Complete 98 semester hours in the major.

## Program Requirement

132 total semester hours required

## Plan of Study

### Notes on Physics Plans of Study

Some required physics courses are offered in both fall and spring semesters, while other required courses are offered less frequently. Therefore, the suggested plan of study will vary from student to student, depending on the year of entry for that student.

*See course offering schedule at the end of the plans of study.*

Please contact your academic advisor for additional information and plans of study.

## Even-Numbered Year One

### FIVE YEARS, THREE CO-OPS IN SUMMER 2/FALL

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
ENGW 1111		4 MATH 1342		4 Vacation		Vacation		
MATH 1341		4 PHIL 2325		4				
PHIL 1115		4 PHYS 1165		4				
PHYS 1000		1 PHYS 1166		1				
PHYS 1161		4 PHYS 1167		0				
PHYS 1162		1 Elective		4				
PHYS 1163		0						
		<b>18</b>		<b>17</b>		<b>0</b>		<b>0</b>
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
MATH 2321		4 EESC 2000		1 Vacation		Co-op		0
PHIL 2330		4 MATH 2341		4				
PHYS 2303		4 PHYS 3601		4				
PHYS 2371		3 PHIL elective		4				
PHYS 2372		1 PHIL elective		4				
		<b>16</b>		<b>17</b>		<b>0</b>		<b>0</b>
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		0 PHIL 4500		4 PHYS 3600		4 Co-op		0
		PHYS 4115		4 Elective		4		
		PHIL elective		4				
		PHYS elective		4				
		<b>0</b>		<b>16</b>		<b>8</b>		<b>0</b>
Year 4								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		0 ENGW 3307		4 Critical Philosophy Elective		4 Co-op		0
		PHIL 4510		4 Elective		4		
		PHYS 3602		4				
		PHIL elective		4				
		<b>0</b>		<b>16</b>		<b>8</b>		<b>0</b>
Year 5								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		0 PHYS 4305		4				
		PHIL advanced elective		4				
		Elective		4				
		Elective		4				
		<b>0</b>		<b>16</b>				

Total Hours: 132

### FOUR YEARS, TWO CO-OPS IN SUMMER 2/FALL

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
ENGW 1111		4 MATH 1342		4 MATH 2321		4 MATH 2341		4
MATH 1341		4 PHIL 2325		4 Elective		4 Elective		4
PHIL 1115		4 PHIL 2330		4				
PHYS 1000		1 PHYS 1165		4				
PHYS 1161		4 PHYS 1166		1				

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PHYS 1162	1	PHYS 1167	0				
PHYS 1163	0						
	<b>18</b>		<b>17</b>		<b>8</b>		<b>8</b>
<b>Year 2</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
PHYS 2303	4	EESC 2000	1	PHYS 3600	4	Co-op	0
PHYS 2371	3	PHYS 3601	4	Elective	4		
PHYS 2372	1	PHYS 3602	4				
PHIL elective	4	PHIL elective	4				
PHIL elective	4	PHIL elective	4				
	<b>16</b>		<b>17</b>		<b>8</b>		<b>0</b>
<b>Year 3</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
Co-op	0	PHIL 4500	4	ENGW 3307	4	Co-op	0
		PHIL 4510	4	Elective	4		
		PHYS 4115	4				
		PHYS elective	4				
	<b>0</b>		<b>16</b>		<b>8</b>		<b>0</b>
<b>Year 4</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>				
Co-op	0	PHYS 4305	4				
		PHIL advanced elective	4				
		Elective	4				
		Elective	4				
	<b>0</b>		<b>16</b>				

Total Hours: 132

**OFFERING SCHEDULE (SUBJECT TO CHANGES)**

- Modern Physics (PHYS 2303) offered every fall, spring, and summer 2
- Electronics (PHYS 2371)/Lab for PHYS 2371 (PHYS 2372) offered every fall
- Advanced Physics Laboratory (PHYS 3600) offered every summer 1 and summer 2
- Classical Dynamics (PHYS 3601) offered spring and fall (even years)
- Electricity and Magnetism 1 (PHYS 3602) offered every fall and spring
- Electricity and Magnetism 2 (PHYS 3603) offered fall (even years) and summer 1 (odd years)
- Quantum Mechanics (PHYS 4115) offered every fall and spring
- Thermodynamics and Statistical Mechanics (PHYS 4305) offered every spring and summer 2 (even years)
- Biological Physics 1 (PHYS 4621) offered spring (odd years) and fall (even years)
- Medical Physics (PHYS 4623) offered summer 1 and fall (even years)
- Medical Physics Seminar 1 (PHYS 4651) offered spring and fall (odd years)
- Medical Physics Seminar 2 (PHYS 4652) offered every spring
- Principles of Experimental Physics (PHYS 5318) offered every spring