Mathematics and Physics, BS

Mathematics and physics have been linked since antiquity. By combining physics and mathematics you can take closely related courses in each discipline, such as statistical mechanics and stochastic processes, mechanics and dynamical systems, thermodynamics and Fourier series, and quantum mechanics and partial differential equations. The two departments jointly offer a course in mathematical methods in physics.

Program Requirements

- Concentrations and course offerings may vary by campus and/or by program modality. Please consult with your advisor or admissions coach for the course availability each term at your campus or within your program modality.
- Certain options within the program may be *required* at certain campuses or for certain program modalities. Please consult with your advisor or admissions coach for requirements at your campus or for your program modality.

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 (https://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

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

Mathematics Requirements

Code	Title	Hours
Calculus		
A grade of C or higher is required:		
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
Intermediate and Advanced Math		
MATH 2331	Linear Algebra	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4
MATH 3081	Probability and Statistics	4
MATH 3175	Group Theory	4
Co-op Reflections		
MATH 3000	Co-op and Experiential Learning Reflection Seminar 1	1
Mathematics Elective		
Complete two courses in the following range:		8
MATH 3101 to MATH 4899		
PHYS 4115	Quantum Mechanics	

Physics Requirements

Code	Title	Hours
Physics 1		
Complete one of the following:		5
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	
PHYS 1161 and PHYS 1162	Physics 1 and Lab for PHYS 1161	
Physics 2		
Complete one of the following:		5

PHYS 1155 and PHYS 1156 and PHYS 1157	Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155	
PHYS 1165 and PHYS 1166	Physics 2 and Lab for PHYS 1165	
Intermediate Physics		
PHYS 2303	Modern Physics	4
PHYS 2371 and PHYS 2372	Electronics and Lab for PHYS 2371	4
Advanced Physics		
PHYS 3600	Advanced Physics Laboratory	4
PHYS 3602	Electricity and Magnetism 1	4
PHYS 4305	Thermodynamics and Statistical Mechanics	4
Elective Courses		
Complete two courses in the following range:		8
PHYS 3000 to PHYS 7999		

Additional Requirements

Code	Title	Hours
Capstone Requirement		
Complete one of the following:		4
MATH 4020	Research Capstone	
MATH 4025	Applied Mathematics Capstone	
MATH 5131	Introduction to Mathematical Methods and Modeling	

Integrative Courses

Code	Title	Hours
MATH 4545	Fourier Series and PDEs	4
or MATH 4525	Applied Analysis	
PHYS 3601	Classical Dynamics	4

Combined Major Credit Requirement

Complete 87 semester hours in the major.

Program Requirement

128 total semester hours required

Plan of Study

Notes on Physics Courses in Sample Plan 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.

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

Five Years, Three Co-ops in Summer 2/Fall

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
MATH 1341	4	MATH 1342	4	Vacation	0	Vacation	0
ENGW 1111	4	PHYS 1165	4				
Elective	4	PHYS 1166	1				
PHYS 1161	4	Elective	4				
PHYS 1162	1	Elective	4				
MATH 1000	1						
	18		**17**		**0**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
MATH 2321	4	MATH 2341	4	Vacation	0	Co-op	0

Elective	4	MATH 2331	4				
PHYS 2303	4	Elective	4				
PHYS 2371	3	EESC 2000	1				
PHYS 2372	1	PHYS 3601	4				
	16		**17**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	PHYS 3602	4	PHYS 3600	4	Co-op	0
		PHYS 4305	4	MATH 3081	4		
		MATH 3000	1				
		MATH elective	4				
		Elective	4				
	0		**17**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	MATH 3175	4	Elective	4	Co-op	0
		MATH elective	4	Elective	4		
		PHYS undergraduate elective	4				
		ENGW 3315	4				
	0		**16**		**8**		**0**

Year 5

Fall	Hours	Spring	Hours
Co-op	0	PHYS undergraduate elective	4
		PHYS undergraduate elective	4
		MATH 4025	4
		MATH 4545	4
	0		**16**

Total Hours: 133

PHYSICS COURSE OFFERING SCHEDULE

PHYS 2303 offered every fall, spring, and summer 2

PHYS 2371/PHYS 2372 offered every fall

PHYS 3600 offered every summer 1 and summer 2

PHYS 3601 offered every fall and spring

PHYS 3602 offered every fall and spring

PHYS 3603 offered fall, spring all years, and summer 1 (odd years)

PHYS 4115 offered every fall and spring

PHYS 4305 offered fall, spring all years, and summer 2 (even years)

PHYS 4621 offered fall (even years) and spring (odd years)

PHYS 4623 offered fall (even years) and summer 1 (even years)

PHYS 4651 offered fall (odd years) and spring (odd years)

PHYS 4652 offered every spring

PHYS 5318 offered every spring