APPLIED PHYSICS (BS)

Department Website (https://engineering.nyu.edu/academics/departments/applied-physics/)

NYSED: 08871 **HEGIS:** 1902.00 **CIP:** 14.1201

Program Description

Applied Physics is devoted to studying and understanding the fundamental principles of nature. Considered the most fundamental science, it deals with the constituents, properties, and evolution of the entire universe, from the smallest subatomic particles to the largest galaxies.

At the School of Engineering, our BS in Applied Physics students study physics while working directly alongside engineers. That relationship provides lasting value, as graduates gain the flexibility to pursue diverse career opportunities. Students are encouraged to explore interests in areas such as entrepreneurship, biophysics, biomedical instrumentation, integrated circuit electronics, scanning probe metrology, and computational science. Notably, these explorations can also lead to a dual degree, particularly in subjects such as electrical engineering, mechanical engineering, and chemistry.

With a strong foundation in physics, many of our students go on to pursue advanced studies at the master's level. Many of our graduates seek positions within and beyond the sciences, in fields that include law, writing, and business. Others find a career in disciplines that rely on a solid foundation in physics, be it in industry, government, or education.

The department also offers a Minor in Applied Physics (https://bulletins.nyu.edu/undergraduate/engineering/programs/applied-physics-minor/) for students wishing to complement their major studies.

Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html).

Program Requirements

The program requires the completion of 128 credits, comprised of the following:

Course	Title	Credits
Core Physics Requirements		
PH-UY 1002	Physics: The Genesis of Technology	2
PH-UY 1013	Mechanics	3
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
PH-UY 2033	Waves, Optics, & Thermodynamics	3
PH-UY 2131	General Physics Laboratory II	1
PH-UY 2104	Analytical Mechanics	4
PH-UY 2344	Introduction to Modern and Solid State Physics	4
PH-UY 3002	Junior Physics Laboratory	2
PH-UY 3234	Electricity and Magnetism	4
PH-UY 3801	Guided Studies in Physics	1
PH-UY 4124	Thermodynamics and Statistical Physics	4
PH-GY 6673	Quantum Mechanics I	3
PH-UY 4912	Senior Seminar in Physics	2
Additional Major Requirements		
MA-UY 1024	Calculus I for Engineers	4
MA-UY 1124	Calculus II for Engineers	4
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
MA-UY 2034	Linear Algebra and Differential Equations	4
MA-UY 2224	Probability and Statistics for Engineers	4
Select one of the following Chemistry sequences:		4
CM-UY 1003 & CM-UY 1001	General Chemistry for Engineers and General Chemistry for Engineers Laboratory	
or CM-UY 1013 & CM-UY 1011	General Chemistry I and General Chemistry Laboratory I	
CS-UY 1114	Intro To Programming & Problem Solving	4
EXPOS-UA 1	Writing as Inquiry	4
EXPOS-UA 22	Advanced Writing for Engineers	4
EG-UY 1001	Engineering and Technology Forum	1
Electives		
Physics and Mathematics		
Select 16 physics elective credits		16
Select 4 mathematics elective credits		4
Humanities and Social Sciences		
Select 16 humanities or social sciences elective credits [1]		16
STEM & Free Electives, Project and Independent Study		
Select 18 credits of independent study, STEM and free electives [2]		18
Total Credits		**128**

[1] These 4 courses can be within a single cluster or across multiple clusters. For optimal breadth of experience, students are encouraged to take electives across clusters and/or across disciplines within a cluster. These 4 humanities and social sciences electives must satisfy the following:

- 1 must be a 3000/4000 level humanities or social sciences elective
- 1 must be an Advanced Seminar, identifiable by course number 4504
- For new first-year students entering in or after Fall 2022, one course must be a course in **ethics and technological and/or scientific practice**. Most students will take STS-UY 2144 Ethics and Technology to fulfill this requirement, but other ethics courses may serve to fulfill this requirement (https://docs.google.com/document/d/1tmz8KYzplsP7YBUnSn9DtcVP_f4fVRTnbYrvk9BZYa0/edit/), with adviser and TCS Ethics Program Director permission.

See General Education Requirements (https://engineering.nyu.edu/academics/departments/technology-culture-and-society/general-education-requirements/) for further details.

[2] It is strongly recommended that students use 6 of these credits toward a senior project or thesis topic. The program adviser must approve electives selected from other disciplines.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
PH-UY 1002	Physics: The Genesis of Technology	2
MA-UY 1024	Calculus I for Engineers	4
EXPOS-UA 1	Writing as Inquiry	4
Select one of the following Chemistry sequences:		4
CM-UY 1003 & CM-UY 1001	General Chemistry for Engineers and General Chemistry for Engineers Laboratory	
CM-UY 1013 & CM-UY 1011	General Chemistry I and General Chemistry Laboratory I	
EG-UY 1001	Engineering and Technology Forum	1
	Credits	**15**
2nd Semester/Term		
PH-UY 1013	Mechanics	3
MA-UY 1124	Calculus II for Engineers	4
CS-UY 1114	Intro To Programming & Problem Solving	4
EXPOS-UA 22	Advanced Writing for Engineers	4
	Credits	**15**
3rd Semester/Term		
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
MA-UY 2224	Probability and Statistics for Engineers	4
Humanities and Social Sciences Elective		4
	Credits	**16**
4th Semester/Term		
PH-UY 2033	Waves, Optics, & Thermodynamics	3
PH-UY 2131	General Physics Laboratory II	1
PH-UY 2344	Introduction to Modern and Solid State Physics	4
MA-UY 2034	Linear Algebra and Differential Equations	4
Humanities and Social Sciences Elective		4
	Credits	**16**
5th Semester/Term		
PH-UY 2104	Analytical Mechanics	4
Physics Elective		4
Math Elective		4
Humanities and Social Sciences Elective		4
	Credits	**16**
6th Semester/Term		
PH-UY 3002	Junior Physics Laboratory	2
PH-UY 3234	Electricity and Magnetism	4
Physics Elective		3
STEM Elective		3
Humanities and Social Sciences Elective		4
	Credits	**16**
7th Semester/Term		
PH-GY 6673	Quantum Mechanics I	3
PH-UY 4902	Introduction to Senior Project in Physics	2
PH-UY 4912	Senior Seminar in Physics	2
Physics Elective		3
STEM Elective		3
Free Elective		3
PH-UY 3801	Guided Studies in Physics	1
	Credits	**17**
8th Semester/Term		
PH-UY 4124	Thermodynamics and Statistical Physics	4
PH-UY 4904	Senior Project in Physics	4
Physics Elective		3
Physics Elective		3
Free Elective		3
	Credits	**17**
	Total Credits	**128**

Learning Outcomes

Upon successful completion of the program, graduates will:

1. Demonstrate a strong foundation in the principles of physics, with emphasis on fundamental knowledge.
2. Exhibit the ability to apply the universal logic of science.
3. Develop intermediate skills and knowledge beyond the foundational level in select areas of applied physics.
4. Develop the analytical skills and knowledge needed to pursue physics-based careers.

Policies

NYU Policies

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (https://bulletins.nyu.edu/undergraduate/engineering/academic-policies/).