

B.S. in Applied Physics

(120 credits minimum)

Bachelor of Science in Applied Physics - Astronomy Option

First Year

1st Semester

		Credits
ENGL 101	English Composition: Introduction to Academic Writing	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
MATH 111	Calculus I	4
CS 113 or CS 115	Introduction to Computer Science I or Introduction to Computer Science I in C++	3
CHEM 125 or CHEM 121	General Chemistry I or Fundamentals of Chemical Principles I	3
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

PHYS 114	Introduction to Data Reduction with Applications	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
MATH 112	Calculus II	4
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
CHEM 125A	General Chemistry Lab I	1
Term Credits		15

Second Year

1st Semester

MATH 213	Calculus III B	4
MATH 225	Survey of Probability and Statistics *	1
PHYS 234	Physics III	3
PHYS 231A	Physics III Lab	1
History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
ENGL 102	English Composition: Introduction to Writing for Research	3
Term Credits		15

2nd Semester

MATH 222	Differential Equations	4
MATH 328	Mathematical Methods for Scientists and Engineers	3
PHYS 335 or R750 315	Introductory Thermodynamics or Intro Thermodynamics	3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Term Credits		13

Third Year

1st Semester

PHYS 432	Electromagnetism I	3
PHYS 320	Astronomy and Astrophysics I	3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
PHYS 430	Classical Mechanics I	3

MATH Elective		3
Term Credits		15
2nd Semester		
PHYS 433	Electromagnetism II	3
PHYS 321	Astronomy and Astrophysics II	3
PHYS 418	Fundamentals of Optical Imaging	3
Math/Phys/CS Elective		3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		15
Fourth Year		
1st Semester		
PHYS 420	Special Relativity	3
PHYS 442	Introduction to Quantum Mechanics	3
or R750 404	or Quantum Mechanics	
Math/Physics/CS Elective		3
Technical Elective		3
Social Science GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger/)		3
Term Credits		15
2nd Semester		
PHYS 322	Observational Astronomy	3
PHYS 421	General Relativity	3
PHYS 450	Advanced Physics Lab	3
Technical Elective		3
Technical Elective		3
Term Credits		15
Total Credits		120

* Students can take MATH 333 (Probability and Statistics) instead of MATH 225

Electives

Math/Phys/CS

Consult the physics department for information about qualifying courses.

Technical

Consult the physics department for information about qualifying courses.

Refer to the **General Education Requirements** for further information on GER electives.

Co-op Courses

Co-op courses bearing degree credit replace a technical elective or another course approved by the faculty advisor in the students major department. In applied physics, both PHYS 311 Co-op Work Experience I and PHYS 411 Co-op Work Experience II are taken for degree Credit with permission.

Bachelor of Science in Applied Physics - Optical Science and Engineering Option

(120 credits minimum)

First Year

1st Semester

		Credits
ENGL 101	English Composition: Introduction to Academic Writing	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
MATH 111	Calculus I	4

CS 113 or CS 115	Introduction to Computer Science I or Introduction to Computer Science I in C++	3
CHEM 125 or CHEM 121	General Chemistry I or Fundamentals of Chemical Principles I	3
FYS SEM	First-Year Student Seminar	0
Term Credits		17
2nd Semester		
PHYS 114	Introduction to Data Reduction with Applications	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
MATH 112	Calculus II	4
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
CHEM 125A	General Chemistry Lab I	1
Term Credits		15
Second Year		
1st Semester		
MATH 213	Calculus III B	4
MATH 225	Survey of Probability and Statistics *	1
PHYS 234	Physics III	3
PHYS 231A	Physics III Lab	1
History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
ENGL 102	English Composition: Introduction to Writing for Research	3
Term Credits		15
2nd Semester		
MATH 222	Differential Equations	4
MATH 328	Mathematical Methods for Scientists and Engineers	3
PHYS 335 or R750 315	Introductory Thermodynamics or Intro Thermodynamics	3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Term Credits		13
Third Year		
1st Semester		
OPSE 301	Introduction to Optical Science and Engineering	3
OPSE 310	Virtual Instrumentation	3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
PHYS 430	Classical Mechanics I	3
PHYS 432	Electromagnetism I	3
Term Credits		15
2nd Semester		
OPSE 402	High Power Laser and Photonics Applications	3
PHYS 433	Electromagnetism II	3
PHYS 418	Fundamentals of Optical Imaging	3
PHYS 446	Solid State Physics	3
Phys/OPSE Elective		3
Term Credits		15
Fourth Year		
1st Semester		
PHYS 442 or R750 404	Introduction to Quantum Mechanics or Quantum Mechanics	3

Phys/OPSE/EE Elective	3
Technical Elective	3
Technical Elective	3
Social Science GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger/)	3
Term Credits	15
2nd Semester	
PHYS 450 Advanced Physics Lab	3
Free Elective	3
Technical Elective	3
Phys/EE Elective	3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)	3
Term Credits	15
Total Credits	120

* Students can take MATH 333 (Probability and Statistics) instead of MATH 225

Electives

Phys/OPSE

Consult the physics department for information about qualifying courses.

Math/Phys/CS

Consult the physics department for information about qualifying courses.

Math/Phys/EE/CS

Consult the physics department for information about qualifying courses.

Technical

Consult the physics department for information about qualifying courses.

See the **General Education Requirements** "Refer to the General Education Requirements for specific information for GER courses"

Co-op Courses

Co-op courses bearing degree credit replace a technical elective or another course approved by the faculty advisor in the students major department. In applied physics, both PHYS 311 Co-op Work Experience I and PHYS 411 Co-op Work Experience II are taken for degree Credit with permission.

This curriculum represents the maximum number of credits per semester for which a student is advised to register. A full-time credit load is 12 credits.

First-year students are placed in a curriculum that positions them for success which may result in additional time needed to complete curriculum requirements. Continuing students should consult with their academic advisor to determine the appropriate credit load.