

# B.S. in Applied Physics

(120 credits minimum)

## Bachelor of Science in Applied Physics - Astronomy Option

Course	Title	Credits
<b>First Year</b>		
<b>1st Semester</b>		
HUM 101	English Composition: Writing, Speaking, Thinking I	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Laboratory	1
MATH 111	Calculus I	4
CS 113 or CS 115	Introduction to Computer Science or Intro. to CS I in C++	3
CHEM 125 or CHEM 121	General Chemistry I or Fundamentals of Chemical Principles I	3
FRSH SEM	Freshman Seminar	0
	Term Credits	17
<b>2nd Semester</b>		
PHYS 114	Introduction to Data Reduction with Applications	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Laboratory	1
MATH 112	Calculus II	4
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
CHEM 124	General Chemistry Laboratory	1
	Term Credits	15
<b>Second Year</b>		
<b>1st Semester</b>		
MATH 213	Calculus III B	4
MATH 225 or MATH 333	Survey of Probability and Statistics or Probability and Statistics	1-3
PHYS 234	Physics III	3
PHYS 231A	Physics III Laboratory	1
	History and Humanities GER 200 level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level</a> )	3
HUM 102	English Composition: Writing, Speaking, Thinking II	3
	Term Credits	15-17
<b>2nd Semester</b>		
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 ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level</a> )	3
	Term Credits	13
<b>Third Year</b>		
<b>1st Semester</b>		
PHYS 432	Electromagnetism I	3
PHYS 320	Astronomy and Astrophysics I	3
	History and Humanities GER 300+ level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level</a> )	3

PHYS 430	Classical Mechanics I	3
MATH Elective		3
Term Credits		15
<b>2nd Semester</b>		
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 ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone</a> )		3
Term Credits		15
<b>Fourth Year</b>		
<b>1st Semester</b>		
PHYS 420	Special Relativity	3
PHYS 442 or R750 404	Introduction to Quantum Mechanics or Quantum Mechanics	3
Math/Physics/CS Elective		3
Technical Elective		3
Social Science GER ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger</a> )		3
Term Credits		15
<b>2nd Semester</b>		
PHYS 322	Observational Astronomy	3
PHYS 421	General Relativity	3
PHYS 450	Advanced Physics Laboratory	3
Technical Elective		3
Technical Elective		3
Term Credits		15
Total Credits		120-122

## 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)

Course	Title	Credits
<b>First Year</b>		
<b>1st Semester</b>		
HUM 101	English Composition: Writing, Speaking, Thinking I	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Laboratory	1
MATH 111	Calculus I	4

CS 113 or CS 115	Introduction to Computer Science or Intro. to CS I in C++	3
CHEM 125 or CHEM 121	General Chemistry I or Fundamentals of Chemical Principles I	3
FRSH SEM	Freshman Seminar	0
Term Credits		17
<b>2nd Semester</b>		
PHYS 114	Introduction to Data Reduction with Applications	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Laboratory	1
MATH 112	Calculus II	4
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
CHEM 124	General Chemistry Laboratory	1
Term Credits		15
<b>Second Year</b>		
<b>1st Semester</b>		
MATH 213	Calculus III B	4
MATH 225 or MATH 333	Survey of Probability and Statistics or Probability and Statistics	1
PHYS 234	Physics III	3
PHYS 231A	Physics III Laboratory	1
History and Humanities GER 200 level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level</a> )		3
HUM 102	English Composition: Writing, Speaking, Thinking II	3
Term Credits		15
<b>2nd Semester</b>		
MATH 222	Differential Equations	4
MATH 328	Mathematical Methods for Scientists and Engineers	3
MATH 335 or R750 315	Vector Analysis or Intro Thermodynamics	3
History and Humanities GER 300+ level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level</a> )		3
Term Credits		13
<b>Third Year</b>		
<b>1st Semester</b>		
OPSE 301	Introduction to Optical Science and Engineering	3
OPSE 310	Virtual Instrumentation	3
History and Humanities GER 300+ level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level</a> )		3
PHYS 430	Classical Mechanics I	3
PHYS 432	Electromagnetism I	3
Term Credits		15
<b>2nd Semester</b>		
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 ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger</a> )		3
Term Credits		15

**2nd Semester**

PHYS 450	Advanced Physics Laboratory	3
Free Elective		3
Technical Elective		3
Phys/EE Elective		3
Humanities and Social Science Senior Seminar GER ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone</a> )		3
Term Credits		15
Total Credits		120

**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.

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.

*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.*