

# Physics & Law, Technology and Culture (Optical Science & Engineering Option) - B.S.

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(135 credits minimum)

**First Year**

<b>1st Semester</b>		<b>Credits</b>
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 121 or CHEM 125	Fundamentals of Chemical Principles I or General Chemistry I	3
FYS SEM	First-Year Student Seminar	0
<b>Term Credits</b>		<b>17</b>

**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
<b>Term Credits</b>		<b>15</b>

**Second Year****1st Semester**

MATH 213	Calculus III B	4
MATH 225	Survey of Probability and Statistics <sup>1</sup>	1
PHYS 234	Physics III	3
PHYS 231A	Physics III Lab	1
ENGL 102	English Composition: Introduction to Writing for Research	3
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
<b>Term Credits</b>		<b>15</b>

**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
Legal Foundations Elective <sup>2</sup>		3
LTC Core Elective		3
<b>Term Credits</b>		<b>16</b>

**Third Year****1st Semester**

OPSE 301	Introduction to Optical Science and Engineering	3
OPSE 310	Virtual Instrumentation	3
PHYS 430	Classical Mechanics I	3
PHYS 432	Electromagnetism I	3
Legal Foundations Elective <sup>2</sup>		3
<b>Term Credits</b>		<b>15</b>

**2nd Semester**

OPSE 402	High Power Laser and Photonics Applications	3
PHYS 433	Electromagnetism II	3
PHYS 446	Solid State Physics	3
PHYS 418	Fundamentals of Optical Imaging	3
Elective (Physics/OPSE) <sup>3</sup>		3

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<b>Term Credits</b>	<b>15</b>
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**Fourth Year****1st Semester**

PHYS 442 or R750 404	Introduction to Quantum Mechanics or Quantum Mechanics	3
Elective (Physics/OPSE/EE) <sup>4</sup>		3
Technical Elective <sup>5</sup>		3
LTC Core Elective		3
Legal Foundations Elective		3

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<b>Term Credits</b>	<b>15</b>
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**2nd Semester**

PHYS 450	Advanced Physics Lab	3
Elective (Physics/EE) <sup>6</sup>		3
Technical Elective <sup>5</sup>		3
LTC Core Elective		3
HSS 404	Humanities, History and Social Sciences Senior Seminar <sup>7</sup>	3

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<b>Term Credits</b>	<b>15</b>
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**Fifth Year****1st Semester**

HIST 310 or HIST 490 or R510 490	Co-op in Law, Technology, Culture and History I <sup>8</sup> or Seminar - Research or Seminar:Research	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
LTC Core Elective		3
Technical Elective <sup>5</sup>		3

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<b>Term Credits</b>	<b>12</b>
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<b>Total Credits</b>	<b>135</b>
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<sup>1</sup> Math 333 is an acceptable alternative to Math 225

<sup>2</sup> The first two Legal Foundations Electives must satisfy the History and Humanities 300 Level GER (<https://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/>).

<sup>3</sup> Physics/OPSE Electives: Consult the Physics Department for information about qualifying courses.

<sup>4</sup> Physics/OPSE/EE Electives: Consult the Physics Department for information about qualifying courses.

<sup>5</sup> Technical Electives: Consult the Physics Department for information about qualifying courses.

<sup>6</sup> Physics/EE Electives: Consult the Physics Department for information about qualifying courses.

<sup>7</sup> Must be a law-related HSS 404 History Seminar approved by LTC Advisor.

<sup>8</sup> Students may take a History Research Seminar (HIST 490 or R510 490) instead of HIST 310 with the approval of the LTC advisor. Student projects in the history research seminar must be law-related.

Code	Title	Credits
<b>LEGAL FOUNDATIONS ELECTIVES</b>		
Select three of the following:		
HIST 342	Civil Rights Revolution and Law	3
HIST 361	The Founding of the American Nation	3
HIST 362	Sex, Gender, and the Law in American History	3
HIST 364	American Law in the World	3
HIST 369	Law and Society in History	3

HIST 395	Research Methods in Law and Society	3
MGMT 290	Business Law I	3
STS 300	Legal Reasoning, Writing, and Technology	3
R790 304	Intro Law And Legal Res	3

Code	Title	Credits
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**LTC CORE ELECTIVES**

Select four of the following:

EVSC 335	Environmental Law	3
HIST 320	Law and Evidence	3
HIST 338	Environmental Justice and Climate Change in America	3
HIST 370	Legal issues in the History of Media	3
HIST 375	Legal Issues in Environmental History	3
HIST 378	Medicine and Health Law in Modern America	3
HIST 384	Invention and Regulation	3
IE 447	Legal Aspects of Engineering	3
IT 331	Privacy and Information Technology	3
IT 332	Digital Crime	3
IT 400	Information Technology and the Law	3
R790 382	Environm Pol & Policy	3