

GEP

Physics Major Requirements [rev. 3/13/2014]

Degree Requirements: 40 courses are required for graduation. These 40 courses are comprised of:

A) GEP Signature Core, B) GEP Integrative Learning Courses, C) GEP Variable courses, D) Free electives E) Overlays, and F) Major Requirements

A. GEP Signature Core Courses (6 Courses) All non-transfer students must take these 6 Courses at SJU.	Semester completed
1. PHL 154 – Moral Foundations	
2. THE 154 – Faith, Justice & the Catholic Tradition	
3. ENG 102 – Texts and Contexts (pre-req: ENG 101)	
4. HIS 154 – Forging the Modern World	
5. First Year Seminar (transfer students are exempt from this requirement)	
6. Faith and Reason Course (pre-reqs: PHL 154 and THE 154) <i>See bottom of next page for changes for Classes of 2014 & 2015</i>	

B. GEP Integrative Learning Courses for Physics (3 courses)	Semester Completed
1. MAT 213 Calculus III	
2-3. Students take 2 of the following 4 courses:	
<ul style="list-style-type: none"> BIO 101 Biology I: Cells 	
<ul style="list-style-type: none"> BIO 102 Biology II: Genetics & Evolutionary Biology 	
<ul style="list-style-type: none"> CHM 120 General Chemistry I Lecture* 	
<ul style="list-style-type: none"> CHM 125 General Chemistry II Lecture* 	

* Students are encouraged, but not required to take the associated Chemistry Labs

C. GEP Variable Course (Maximum 9 courses)	Course(s) required/taken Please note students may earn AP credit and/or use transfer credits to meet these requirements	Semester Completed
Fine & Performing Arts or Literature	One course	
Mathematics (Beauty)	MAT 161 Calculus I required	
Natural Science	Physics 105/105L University Physics with Lab	
Non-Native Language	1-2 courses at the level in which the student is placed	
Social/Behavioral Science	One course	
Philosophy (Philosophical Anthropology)	One course (pre-req: PHL 154)	
Theology (Religious Difference)	One course - cannot be used to also satisfy the Diversity/Globalization/Non-Western area studies overlay requirement	
Writing	ENG 101 Craft of Language - May also be satisfied by earning a 4 or a 5 on the English Literature or Language AP test.	

D. Free Electives (Minimum 9 courses)	Semester completed
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	

E. Overlays. Overlays may be combined with major/minor courses, GEP variable courses (unless otherwise noted), or electives.**	Semester Completed
1. Writing-Intensive (pre-req: ENG 101)	
2. Ethics-Intensive (pre-req: PHL 154)	
3. Diversity/Globalization/non-Western	

****See box on bottom of next page for updates on Faith & Reason and overlay requirements for Classes of 2014, 2015, & 2016****

E. Physics Major Requirements (15 courses)*	
Please note that PHY 311 and 312 are 2-credit course. These courses are required for the major, but they do not count toward the 40 courses required for graduation.	
Course	Semester completed
1. MAT 162 Calculus II	
2. PHY 106/106L University Physics with Lab	
3. PHY 251 Modern Physics I	
4. PHY 252 Modern Physics II	
5. PHY 257 Mathematical Methods in Physics	
6. PHY 301 Classical Mechanics	
7. PHY 303 Thermal Physics OR PHY 409 Statistical Mechanics	
8. PHY 307 Electricity & Magnetism	
9. PHY 308 Waves & Optics	
10. PHY 311 Experimental Methods of Physics I (2-credit course – this course is required for the major, but it does not count toward the 40 courses required for graduation)	
11. PHY 312 Experimental Methods of Physics II (2-credit course – this course is required for the major, but it does not count toward the 40 courses required for graduation)	
12. PHY 321 Quantum Mechanics	
13-15. Three PHY 3-credit electives, two of which must be at the 200-level or higher.	

* Students are also required to enroll in PHY 390(non-credit) Physics Seminar each semester.

Concentration in Materials Physics

A student may elect to pursue a course of study leading to expertise in the area of the physics of materials, nanotechnology, or biophysics. The student will select three courses from the following: PHY 253, PHY 261, PHY 262, PHY 407, PHY 405, PHY 413, PHY 419, and PHY 421. These courses will prepare the student for either entry into various areas of the electronics and nanotechnology industries or for entry into graduate programs in various areas of physics or materials science engineering.

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Changes in Faith & Reason, Overlays Requirements

Note for the Class of 2014:

Of the four GEP requirements—Faith & Reason and the three overlay requirements—students in the Class of 2014 need to satisfy two of the four requirements. Students in the Class of 2014 need to complete (1) a Faith and Reason course and one overlay requirement OR (2) two overlay requirements.

Note for the Class of 2015:

Of the four GEP requirements—Faith & Reason and the three overlay requirements—students in the Class of 2015 need to satisfy three of the four. Students in the Class of 2015 would have to complete (1) a Faith and Reason course and two overlay requirements OR (2) all three overlay requirements.

Note for the Class of 2016

Students in the Class of 2016 need to satisfy only two of the three GEP overlay requirements, but they must complete the GEP Faith Reason requirement.

	Fall	Spring
FIRST-YEAR	MAT 161 (Math Beauty) PHY 105, 105L University Physics I + lab ENG101 HIS 154 (Formerly HIS 100) Non-Native Language I	MAT 162 PHY 106, 106L University Physics II + lab ENG 102 First Year Seminar Non-Native Language II
SOPHOMORE	PHY 251 Modern Physics I MAT 213 Calculus III (ILC 1) ¹ ILC 2 ¹ PHL 154 Elective	PHY 252 Modern Physics II PHY 257 Mathematical Methods in Physics ILC 3 ¹ THE 154 Elective or overlay ²
JUNIOR	PHY 303 Thermal Physics THE Religious Diff. Physics Elective Elective Social/Behavioral Science	PHY 301 Classical Mechanics PHL Anthropology Physics Elective Elective or overlay ² Elective
SENIOR	PHY 307 Electricity and Magnetism PHY 311 Exp. Methods of Physics I ³ Physics Elective Faith and Reason Elective or overlay ² Elective	PHY 308 Waves and Optics PHY 312 Exp Methods of Physics II ³ PHY 321 Quantum Mechanics Fine Arts/Literature Elective Elective

1. **Integrative Learning Courses** - students take MAT 213 (Calculus III) and 2 of the following 4 courses:

- BIO 101 Cells
- BIO 102 Genetics & Evolutionary Bio
- CHM 120 Gen Chemistry I
- CHM 125 Gen Chemistry II

Labs for General Chemistry I and II (CHM 120L and 125L) are recommended but not required.

2. **GEP Overlays (see changes to requirements—box on previous page)**

In addition to the courses listed above, student must fulfill the following overlay requirements: 1) one course that is designated as a Diversity, non-Western, or Globalization course, 2) one Ethics-Intensive course, and 3) one Writing –Intensive course. These courses may be fulfilled by a GEP variable course, major course, minor course, or free elective that is certified to meet the requirement. However, the Religious Difference course requirement cannot be used to fulfill the Diversity, Non-Western, or Globalization overlay. To determine which courses have been certified to fulfill these overlays, please use the “Attribute Type” search option in the “Look up classes” search page on My SJU. You also may consult with the SJU Undergraduate Catalog for additional information.

3. **PHY 311 and PHY 312** are 2-credit course that are required for the major, but these two courses do not count toward the 40 courses required for graduation.

4. Physics majors must also register for PHY 390 Physics Seminar (non-credit) each semester.