

PHYSICS

Requirements

Physics

Summary of Graduation Requirements for Physics Major

1. Fifty-six (56) of the credits listed below by the number, with one credit in PH 490 .
2. Fourteen credits of physics courses, besides those listed by number.
3. The program must be approved by the advisor.
4. Twenty credits of technical electives of which at least eight must be in courses other than physics courses (cannot include ECE 340).
5. Cross reference for the following courses:
ECE 340 and ECE 341 for PH 316 and PH 317
ES 312 and ES 214 for PH 235
6. Twelve credits of free electives (cannot include ECE 340).
7. Thirty-six credits of humanities or social sciences courses. The distribution of these courses must meet the requirements of the Department of Humanities, Social Sciences, and the Arts.
8. A technical elective is any RHIT course at or above 200 level in biology, biomathematics, chemistry, computer science, engineering, mathematics, or physics.
9. A free elective is any course offered at RHIT.

Code	Title	Hours
	Physics Course work	56
	Physics Electives ¹	14
	Chemistry and Mathematics Course work ²	43
	Humanities, Social Sciences, and the Arts (Standard requirement)	36
	Technical Electives ³	20
	Free Electives ⁴	12
	Miscellaneous Courses ⁵	11
Total Hours		192

¹ Listed below are the PH elective courses, from which a physics major is required to take 11 hours.

² Chemistry and Mathematics Course work (43 hours)

³ Twenty credits of technical electives are required for a physics major, of which at least eight must be in courses other than physics courses (cannot include ECE 340 Electromagnetic Fields).

⁴ A physics major may take twelve credit hours of free electives, which may include any offered at RHIT.

⁵ Miscellaneous Courses

Listed below are the Physics Core Courses (56 hours):

Code	Title	Hours
PH 111	Physics I	4
PH 112	Physics II	4
PH 113	Physics III	4
PH 200	Career Preparation	1
PH 235	Many-Particle Physics	4
PH 255	Foundations of Modern Physics	4
PH 290	Directed Research	2
or PH 490	Directed Research	
PH 292	Physical Optics	4

PH 314	Theoretical Mechanics I	4
PH 316	Electric & Magnetic Fields	4
PH 317	Electromagnetism	4
PH 325	Adv Physics Laboratory I	4
PH 327	Thermodynamics & Statistical Mechanics	4
PH 401	Introduction to Quantum Mechanics	4
PH 405	Semiconductor Materials & Applications	4
PH 499	Physics Ethics & Communication	1
Total Hours		56

Listed below are the Physics Thesis or Capstone Courses (14 hours):

Code	Title	Hours
PH 496	Senior Thesis	2
PH 497	Senior Thesis	4
PH 498	Senior Thesis	2
PH Electives ¹		6
Or		
PH 425	Advanced Physics Lab II	4
PH Electives ¹		10

Note: The Physics thesis option is intended for students who complete a substantive research project in this field. Students wanting to pursue the Senior Thesis option must find a faculty advisor (from the Physics, Optical Engineering and NanoEngineering Faculty) by the Fall Term of their Senior Year. At that time, the thesis topic should be decided and the research plan developed. Students in the thesis option should enroll in Senior Thesis courses for a total number of 8 credit hours over the three-quarter sequence. Students working on a Senior Thesis will write and submit the thesis to the department and give an oral research presentation as part of PH499.

¹ PH elective courses are any courses at or above 200 level with the PH, OE or NE designation that are not named required courses

Chemistry and Math Courses (43 hours):

Code	Title	Hours
MA 111	Calculus I	5
MA 112	Calculus II	5
MA 113	Calculus III	5
MA 221	Matrix Algebra & Differential Equations I	4
MA 222	Matrix Algebra & Differential Equations II	4
MA 330	Vector Calculus	4
MA 336	Boundary Value Problems	4
MA 371	Linear Algebra I	4
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Lab	1
CHEM 113	General Chemistry II	3
CHEM 113L	General Chemistry II Laboratory	1
Total Hours		43

Miscellaneous Courses

Code	Title	Hours
RHIT 100	Foundations for Rose-Hulman Success	1
EM 104	Graphical Communications	2
OE 450	Laser Systems & Applications	4
Computing Elective		4
Total Hours		11

Second Major in Physics

Listed below are the Physics Second Major Courses (72 hours) :

Code	Title	Hours
PH 111	Physics I	4
PH 112	Physics II	4
PH 113	Physics III	4
PH 235	Many-Particle Physics	4
PH 255	Foundations of Modern Physics	4
PH 292	Physical Optics	4
PH 314	Theoretical Mechanics I	4
PH 316	Electric & Magnetic Fields	4
PH 317	Electromagnetism	4
PH 325	Adv Physics Laboratory I	4
PH 327	Thermodynamics & Statistical Mechanics	4
PH 401	Introduction to Quantum Mechanics	4
PH 405	Semiconductor Materials & Applications	4
PH 425	Advanced Physics Lab II	4
OE 450	Laser Systems & Applications	4
PH Electives ¹		12

¹ PH elective courses are any courses at or above 200 level with the PH, OE or NE designation, except for the NE majors, who need to take PH courses for their PH electives.