

MINOR IN PHYSICS

Program Learning Outcomes for the Minor in Physics

Upon completing the minor in Physics, students will be able to:

1. Acquire and demonstrate a solid foundation of knowledge in physics. This includes: basic mechanics, basic electromagnetism, Maxwell's equations in differential form, waves, interference and diffraction, special relativity, the Schrodinger equation, and the wave formulation of quantum mechanics.
2. Acquire and demonstrate knowledge in a number of advanced physics topics of their choosing.

Requirements for the Minor in Physics

Students pursuing the minor in Physics must complete:

- A minimum of 29 credit hours to satisfy minor requirements.
- A minimum of 26 credit hours to satisfy the Core Requirements.
- A minimum of 3 additional credit hours from departmental (PHYS) course offerings at the 300-level or above.

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor's academic advisor or, where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor's [Official Certifier](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/) (<https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/>)). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Minor in Physics		29

Minor Requirements

Code	Title	Credit Hours
Core Requirements		
<i>Select 1 from the following:</i> ¹		4
PHYS 101 & PHYS 103	MECHANICS (WITH LAB) and MECHANICS DISCUSSION	
PHYS 111	HONORS MECHANICS (WITH LAB)	
<i>Select 1 from the following:</i> ²		4
PHYS 102 & PHYS 104	ELECTRICITY & MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION	
PHYS 112	HONORS ELECTRICITY & MAGNETISM (WITH LAB)	
MATH 101 or MATH 105	SINGLE VARIABLE CALCULUS I ³ AP/OTH CREDIT IN CALCULUS I	3
MATH 102 or MATH 106	SINGLE VARIABLE CALCULUS II ³ AP/OTH CREDIT IN CALCULUS II	3

MATH 211 or MATH 221	ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA HONORS CALCULUS III	3
MATH 212 or MATH 222 or MATH 232	MULTIVARIABLE CALCULUS HONORS CALCULUS IV HONORS MULTIVARIABLE CALCULUS	3
PHYS 201	WAVES, LIGHT, AND HEAT	3
PHYS 202	MODERN PHYSICS	3
Elective Requirement		
<i>Select 3 additional credit hours from departmental (PHYS) course offerings at the 300-level or above.</i> ⁴		3
Total Credit Hours		29

Footnotes and Additional Information

- ¹ The Physics department has determined that credit awarded for PHYS 141 *CONCEPTS IN PHYSICS I* is not eligible for meeting the requirements of the Physics minor.
- ² The Physics department has determined that credit awarded for PHYS 142 *CONCEPTS IN PHYSICS II* is not eligible for meeting the requirements of the Physics minor.
- ³ Students without credit for basic calculus (e.g. MATH 101/MATH 105 and/or MATH 102/MATH 106) must either enroll in the relevant course(s) or substitute more advanced MATH or CMOR coursework, with prior approval by the Physics and Astronomy department's Undergraduate Program Committee, to earn the required credit.
- ⁴ The Elective Requirement can be fulfilled by PHYS 332 and PHYS 461, but PHYS 491, PHYS 493, PHYS 492, and PHYS 494 **cannot** be used to fulfill this requirement.

Policies for the Minor in Physics

Program Restrictions and Exclusions

Students pursuing the minor in Physics should be aware of the following program restrictions:

- As noted in [Majors, Minors, and Certificates](https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/) (<https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/>), i.) students may declare their intent to pursue a minor only after they have first declared a major, and ii.) students may not major and minor in the same subject.
- Students pursuing the major in Astronomy may not declare the minor in Physics.
- Students pursuing the major in Astrophysics may not declare the minor in Physics.
- Students pursuing the major in Chemical Physics may not declare the minor in Physics.

Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/) (<https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/>). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the designated transfer credit advisor for the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content). The Office of Academic Advising maintains the university's official list of [transfer credit advisors](https://oaa.rice.edu/advising-network/transfer-credit-advisors/) (<https://oaa.rice.edu/advising-network/transfer-credit-advisors/>) on their website: <https://oaa.rice.edu>. Students are encouraged to meet with the applicable transfer credit

advisor as well as their academic program director when considering transfer credit possibilities.

Additional Information

For additional information, please see the Physics and Astronomy website: <https://physics.rice.edu/>.

Opportunities for the Minor in Physics

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors (<https://ga.rice.edu/undergraduate-students/honors-distinctions/university/>) (*summa cum laude*, *magna cum laude*, and *cum laude*) and Distinction in Research and Creative Work (<https://ga.rice.edu/undergraduate-students/honors-distinctions/university/>). Some departments have department-specific Honors awards or designations.

Additional Information

For additional information, please see the Physics and Astronomy website: <https://physics.rice.edu/>.