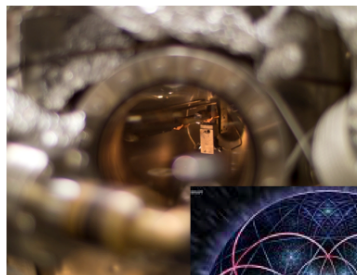




Bachelor of Science in Physics



The faculty and students of the Department of Physics and Astronomy are engaged in explaining and predicting the behavior of the physical world around us, including everything from subatomic particles to supernovas.



Our department combines the best features of a small liberal arts college and a major research university. We are a moderately sized department with accessible faculty dedicated to excellence in teaching.

The BS degree is an intensive program of study providing stronger preparation for graduate school in physics, or a closely related science, than does the BA. Students planning to pursue graduate study normally elect the BS program.

Concentration Requirements for BS degree in Physics

- PHYS 217, 218, 227, 235W, 237, 246 or their close equivalents
- One of the following writing courses: PHYS 243W or 244W or 245W
- An additional 4 credit hours in an approved 200-300 level physics and/or astronomy course.
- Two courses in advanced mathematics: MTH 281 is required and MTH 282 or OPT 287 is recommended.
- Computer literacy course
- One course in a natural science other than physics. This can be an astronomy (ASTR) course, or a course outside the Dept of Physics and Astronomy.
- At least a 2.0 (C) average in astronomy, physics and mathematics courses must be maintained.
- All choices must be approved by the undergraduate physics advisor.

Note: The computer literacy requirement can be satisfied by an introductory college computing course (preferably CSC 161 in the first year, but CSC 171 is also acceptable), or by taking PHY 256 (Computational Physics) taken in the second year.

Graduate courses cannot in general be used to replace undergraduate requirements, but suitably prepared undergraduates may take graduate courses as electives, subject to permission of the course instructor and major advisor.

Please contact our Undergraduate Coordinator with any questions: UGCoordinator@ur.rochester.edu



Four-Year Worksheet: Bachelor of Science in Physics

Physics Pre-Concentration Regular Sequence

First Year	
Fall	Spring
MTH 161: Calculus I	PHY 121: Mechanics
WRT 105: College Writing	MTH 162: Calculus II
Elective or Cluster course	Elective or Cluster course
Elective or Cluster course	Elective or Cluster course
Second Year	
Fall	Spring
PHY 122: Electromagnetism	PHY 123: Modern Physics
MTH 164: Multidimensional Calc.	MTH 165: Linear Algebra & Diff. Eqs
Elective or Cluster course	Elective or Cluster course
Elective or Cluster course	Elective or Cluster course

Physics Pre-Concentration Honors Sequence¹

First Year	
Fall	Spring
PHY 141: Honors Mechanics	PHY 143: Honors Modern Physics ²
MTH 161/171: Honors Calculus I	MTH 162/172: Honors Calculus II
WRT 105: College Writing	Elective or Cluster course ³
Elective or Cluster course	Elective or Cluster course
Second Year	
Fall	Spring
PHY 142: Honors Electromagnetism	PHY 237: Quantum Mech. of Physical Systems
MTH 164/173: Analysis IIIA	MTH 165/174: Honors Calculus IV
Elective or Cluster course	Elective or Cluster course
Elective or Cluster course	Elective or Cluster course

Third Year	
Fall	Spring
PHY 217: Electricity & Magnetism I	PHY 218: Electricity & Magnetism II
PHY 235W: Classical Mechanics	PHY 237: Quantum Mech. of Physical Systems ⁴
MTH 281: Fourier Series	PHY 227: Thermo. & Statistical Mechanics ⁵
Elective	Elective
Fourth Year	
Fall	Spring
PHY 243W: Advanced Experimental Techniques I	PHY 246: Quantum Theory
PHY or AST Elective ⁶	MTH 282: Intro. Complex Variables
Elective	PHY or AST Elective
Elective	Elective

¹ Students who are intending to major in physics or related fields are encouraged to pursue the honors sequence.

² PHY 143 is open to freshmen only, except with permission of the instructor.

³ Students are encouraged to take a course in computer programming during their first or second years in order to satisfy the major's computer literacy requirement. Such courses include CSC 161, 171, ECE 114, and PHY 256.

⁴ Students who have taken PHY 237 in their sophomore year should consider taking PHY 246 in either their junior or senior years.

⁵ The department strongly encourages students planning to go to graduate school in Physics and Astronomy to prepare for the GRE Physics Exam during the summer after junior year, as the exam is typically taken in the fall of senior year. While graduate schools have different policies on how the exam is used in admissions, high scores are always helpful and the review itself provides enrichment. Some copies of old GRE exams are available in the Physics/Optics/Astronomy Library, located on the 3rd floor of Bausch & Lomb Hall, room 374. Before taking the exam, it is also strongly recommended that you have taken PHY 227, Thermodynamics and Statistical Mechanics.

⁶ Depending on what is offered in any given semester, this can typically be PHY 251 (Condensed Matter Physics), PHY 253 (Biological Physics), PHY 254 (20th Century Particle Physics), PHY 256 (Computational Physics), PHY 258 (Energy and the Environment), PHY 391 (Independent Study), PHY 393W (Senior Thesis), PHY 231 (Relativity and Gravitation), AST 241 or AST 242 (Astrophysics) or AST 232 (Dynamics and Statistics of Star Systems), AST 393W (Senior Thesis), or any other 200 level standard physics or astronomy course. Note that the Advanced Experimental Techniques courses PHY 243W and PHY 244W and PHY 245W Advanced Nuclear Science Education Laboratory (ANSEL) are independent; two out of the three can be taken since each course offers a different set of experiments.

Please contact our Undergraduate Coordinator with any questions: UGCoordinator@ur.rochester.edu