



## Bachelor of Arts in Physics and Astronomy



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 BA program is appropriate for students desiring a broad academic experience. It also provides greater flexibility when planning a joint degree with another department. Students preparing for graduate school in astronomy, physics, or a closely related science should consider the more intensive BS program.

### Concentration Requirements for BA degree in Physics and Astronomy

- Two of the following: AST 231, 232, 241, or 242, including at least one of AST 241 or 242
- A total of three other 200 level physics or astronomy courses. Two of the three courses must be selected from the following: PHY 217, 227, 235W, 237.
- Two additional 200 level technical courses, which can be in physics, mathematics, or another science or engineering (not necessarily at the 200 level).
- At least a 2.0 (C) average in astronomy, physics and mathematics courses must be maintained.
- The choices of courses must be approved as a coherent program by the undergraduate physics & astronomy advisor.

**Note:** Equivalent graduate level courses may be substituted when appropriate.



## Four-Year Worksheet: Bachelor of Arts in Physics and Astronomy

### Physics Pre-Concentration Regular Sequence

First Year	
Fall	Spring
AST 111 – Elementary Astronomy I	PHY 121: Mechanics
MTH 161: Calculus I	MTH 162: Calculus II
WRT 105: College Writing	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	AST 142 – Elementary Astrophysics
Elective or Cluster course	Elective or Cluster course

### Physics Pre-Concentration Honors Sequence<sup>1</sup>

First Year	
Fall	Spring
PHY 141: Honors Mechanics	PHY 143: Honors Modern Physics <sup>2</sup>
MTH 171: Honors Calculus I	MTH 172: Honors Calculus II
AST 111 – Elementary Astronomy I	Elective or Cluster course <sup>3</sup>
WRT 105: College Writing	Elective or Cluster course
Second Year	
Fall	Spring
PHY 142 -- Honors Electromagnetism	PHY 237-- Quantum Mech. of Physical Systems
MTH 173 -- Analysis IIIA	MTH 174 -- Honors Calculus IV
Elective or Cluster course	AST 142 – Elementary Astrophysics
Elective or Cluster course	Elective or Cluster course

Third Year	
Fall	Spring
PHY 217 -- Electricity & Magnetism I	PHY 237 -- Quantum Mech. of Physical Systems <sup>4</sup> OR PHY 227 -- Thermo. & Statistical Mechanics <sup>5</sup>
PHY 235W -- Classical Mechanics	MTH 282 – Intro. Complex Variables
MTH 281 -- Fourier Series	AST 241 -- Stellar Astrophysics
AST 232 -- The Milky Way Galaxy <sup>6</sup>	Elective
Fourth Year	
Fall	Spring
AST 231 -- Relativity and Gravitation	AST 242 -- Galaxies and Cosmology
AST or PHY Elective	PHY 246 – Quantum Theory OR PHY 227 – Thermo & Statistical Mech.
Elective or Cluster course	MTH 282 – Intro. Complex Variables
Elective or Cluster course	Elective or Cluster course

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

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

<sup>3</sup> 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.

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

<sup>5</sup> Students continuing to graduate school in physics or in astronomy, generally take the GRE Physics Exam during the Fall of their senior year. Before taking the GREs, it is strongly recommended that you have taken PHY 227, Thermodynamics and Statistical Mechanics, and that you review old copies of GRE exams available in the Physics/Optics/Astronomy Library, located on the 3rd floor of Bausch & Lomb Hall, room 374.

<sup>6</sup> AST 231, AST 232, AST 241 and AST 242 are offered every other year.

Please contact our Undergraduate Coordinator with any questions: [UGCoordinator@UR.Rochester.edu](mailto:UGCoordinator@UR.Rochester.edu)