PHYSICS, ASTRONOMY & ASTROPHYSICS

Physics
The Traditional Physics Major provides students with an in-depth grounding in theoretical and experimental physics at the undergraduate level, as well as guaranteed experience in scientific research. While many of our majors go on to graduate study and careers in physics or closely-related fields, we have structured our programs to be sufficiently flexible that they also accommodate students wishing to study abroad, or to combine physics with other fields of study. In particular, students with diverse academic interests or those who wish to start a physics major in the sophomore year, may wish to consider the Interdisciplinary Physics Major, which has more flexible course requirements that integrate courses from other departments into the major program. Students interested in studying physics intensively through the intermediate level in combination with any other major also may elect the Physics Minor. While concentrations need not be declared until the sophomore or junior year, early advising is very important for avoiding scheduling problems during the junior and senior years. Students interested in combining physics with another program of study should consult with the physics department faculty early in their first year.

Physics advising for first-year students
All students considering taking physics during their time at Haverford should complete the online placement questionnaire before meeting with their premajor advisors. We strongly recommend that students considering a major in physics begin their studies in the first year. Haverford offers two separate fall-spring, year-long, introductory-course sequences in physics, either of which is an appropriate introduction to the physics major. We recommend Physics 105 (or 115) and 106 as the preferred main track for Physics and Astronomy or Astrophysics majors.

- PHYS105a (fall) / 106b (spring) is a sequence designed primarily for those students likely to take physics or closely-related coursework (e.g., astronomy and chemistry) beyond the introductory sequence. This sequence goes into somewhat greater depth in mathematics, mechanics and electromagnetism than PHYS101/102 and uses techniques and ideas relevant to Astronomy more extensively.

- PHYS 115a (fall) is an advanced introductory level course available by placement. This course covers much of the same material as PHYS105a and 101a, but assumes significant background in mechanics at the advanced placement/international baccalaureate level, and in calculus at the high-school level. Students typically continue into PHYS106b in the spring semester after this course.

- PHYS101a (fall) / 102b (spring) is a sequence designed for students desiring a year-long, self-contained treatment of all of physics (including 20th century physics), with an emphasis on applications to the life sciences. This focus makes it particularly appropriate for students interested in biology and prehealth.

- We strongly recommend the following half-credit spring course as a way to learn about exciting current developments in physics and astrophysics early on: ASTRO/PHYS152 - Freshman Seminar in Astrophysics
All introductory physics courses at Haverford are calculus-based. For Physics 105 and 115, students who do not already have a background in calculus at the level of Math 118, should take Math 118 concurrent with their first introductory physics course. For Physics 101, students should either have a background in math at the level of Math 105 or take that course concurrently.

For more information about the sophomore year and beyond, consult our departmental academic program materials at: https://www.haverford.edu/physics-and-astronomy/academic-programs

Astronomy & Astrophysics
At Haverford, students may elect either an Astronomy or Astrophysics major, or an Astronomy minor. These programs require a foundation in physics and share a common set of coursework for the first two years and diverge in the junior and seniors years. The Astronomy major is appropriate for students who desire an in-depth education in astronomy that can be applied to a wide-range of career trajectories, but who do not necessarily intend to pursue graduate study in astronomy. Astronomy majors must take all four 300 level astronomy courses and frequently take additional physics courses. Astronomy majors who are interested in a career in astronomical research are advised to study a great deal of physics as well and, therefore, often complete an Astronomy/Physics double major. The Astrophysics major is appropriate for students who wish to pursue the study of astronomy with additional attention to the physical principles that underlie astrophysical phenomena. The depth of the physics training required for a degree in Astrophysics will prepare students who wish to pursue a career in astronomy or astrophysics, or to enter graduate study in astronomy or astrophysics. Because it involves an integrated program of study in both astronomy and physics, the Astrophysics major may not be combined with a physics major. The Astronomy minor can be combined with any major program offered at Haverford, and provides training in astronomy through the intermediate level.

Astronomy & Astrophysics advising for first-year students
In the first year, the advising for all of these programs is the same. Students should take one of the introductory physics sequences: PHYS 105, or 115 (fall) and 106 (spring), or PHYS 101 (fall) and 102 (spring). See the Physics First-Year Advising document for more information about these various options. In addition, we strongly recommend that prospective majors and minors take in the spring semester of their first-year ASTRO/PHYS152 Freshman Seminar in Astrophysics. This exciting and very popular half-credit course provides a hands-on introduction to current topics in astrophysics research and is designed to be taken alongside a normal 4 credit course load.
For more information about the sophomore year and beyond, consult our departmental academic program materials at: https://www.haverford.edu/physics-and-astronomy/academic-programs

Minors and Concentrations
Any of these majors may be combined with minors or concentrations (depending on the program) in **Biophysics, Education, Engineering, Environmental Studies, Pre-health studies**, and **Scientific Computing**. For more information, consult our departmental website at http://www.haverford.edu/physics-astro

Physics for Pre-Health Students
We recommend that students considering a pre-health curriculum take introductory physics as early as possible, since much of introductory physics is fundamental to chemistry and in turn to biology. All of our introductory physics courses satisfy the premedical undergraduate competencies and prepare students well for the MCAT.

Study Abroad
Many of our majors have done study abroad as part of their degree programs, although this does place a premium on starting your physics major in the first year. Another option is to design a program of study that gives you flexibility by satisfying your physics and mathematics requirements here at Haverford. Contact a physics department faculty member early on along with the Study Abroad coordinator for further information.

Contacts

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