What will your curriculum look like?

Students majoring in physics can work toward a Bachelor of Arts or Bachelor of Science degree. One can also minor in physics. The Brandeis University Bulletin describes the requirements for these options in detail. The core curriculum in physics for a bachelor’s degree includes a sequence of six semester courses plus laboratories, starting with Classical Mechanics, and ending with Quantum Mechanics. Normally, students take one or more years of mathematics beyond the required courses in calculus. For the Bachelor of Science degree, more courses in physics, math, and other sciences are required, encouraging students to broaden their preparation for interdisciplinary studies, or to strengthen their preparation in physics. Most students preparing for graduate studies pursue the B.S. degree, while the B.A allows ample time for joint majors in a broad range of fields including mathematics, computer science, chemistry, biology, biological physics, or neuroscience, but also with economics, music, philosophy, and creative writing, among others.

Electives for the physics major cover a range of topics, both fundamental and of special interest for different career objectives.

The physics major requires three laboratory courses. Our advanced labs cover electronics, microprocessors, and modern experimental methods. These courses are popular, since they relate to technology and applications of physics to practical problems. Some basic electives offered by the department are Statistical Physics, Classical Physics, and Mathematical Physics. More specialized electives include Astrophysics, Condensed Matter Physics, Particle Physics, and Biological Physics. Besides establishing a sound basis for continuing work in physics, these courses are valuable for preparing students to do research with our faculty, perhaps the most important part of an undergraduate career in science, and one of the strongest points of the program at Brandeis.

Undergraduate Research Opportunities

All physics students are strongly encouraged to get involved in research projects. In 2005, 11 seniors did thesis research projects, ranging from laboratory research to computer simulations and complex data analysis to fundamental theory. Our condensed matter research laboratories are equipped with some of the latest technology for basic research in the physics of fascinating systems, including liquid crystals and biological materials. Our new micro-fluidics laboratory offers the chance to fabricate novel experimental devices. Our high-energy experimental physics group has opportunities for work on new particle detectors for the new accelerator at CERN in Switzerland, and for studies of experimental design and data analysis. Our radio astronomy group uses a combination of telescopes worldwide to make high-resolution images of active galactic nuclei, involving massive black holes and relativistic jets of matter. The theory group studies the fundamentals of quantum theory and string theory, the properties of DNA, proteins, and other biological materials, the structure and dynamics of glasses, the flow of granular material, and the regulation of genetic systems in living cells.

What else does the physics program offer?

We bring to campus a steady stream of visitors who present lectures that bring us up to date on the latest advances in research. In 2005, we had a symposium on Einstein’s discoveries and the modern consequences of his work, including the latest studies of gravity and the cosmos. Moreover, we are a small and interactive department, with active student involvement in department events, including physics club, research symposia, and picnics. Our department staff and our graduate students are a constant source of interaction with our undergraduates. We are a community in which we all get to know and appreciate one another.

What kind of career and education options will you have?

Most of our graduates go on to graduate school, while some go into high-tech employment, medical school, or other professional studies. Our students have a record of entering the best graduate programs.

How can you learn more?

Please visit the department website at www.physics.brandeis.edu, or contact the department chair, Professor Robert Meyer, at meyer@brandeis.edu.