

Physics Program

May 2002

Mission

The mission of the UH Hilo Physics program is to provide students with working knowledge of the physical laws that govern the universe from the smallest to the largest scales. The program provides broad training for those intending graduate work and/or future technical, industrial or research careers in the physical sciences or related fields. It also provides basic training for majors in other scientific disciplines as well as for future school teachers.

Goals and Objectives

1. To develop a basic understanding of physical concepts in mechanics, waves, thermodynamics, electricity, magnetism, optics, atomic and nuclear physics, and quantum mechanics.
 - a. To develop elementary understanding of mechanics, waves, optics and electromagnetism. *Criteria:* performance in courses in the introductory sequences.
 - b. To develop advanced understanding of undergraduate-level physics. *Criteria:* performance in upper-division courses, on the physics Major Field Test or on the physics GRE test.
2. To develop appropriate skills for the analysis of physical systems. These include the ability to extract data from real systems, and skills for the mathematical study of physical models.
 - c. To develop appropriate analytical and computational skills to solve physical problems: knowledge of computer programming, mathematics, and/or tools from numerical analysis. *Criteria:* performance in mathematical or computational methods courses.
 - d. To acquire appropriate experimental, instrumental and observational skills to study physical systems. *Criteria:* performance in experimental or observational courses.
3. To develop scientific reasoning and critical thinking skills. To learn to recognize correct and incorrect argumentation.
 - e. To perform adequate scientific reasoning, with sound physical arguments. *Criteria:* performance in every course in the curriculum, technical writing course, senior project.

- f. To learn to think critically, especially about scientific ethics and the impact of science in society. *Criteria:* performance in relevant general education courses.
4. To develop appropriate oral and written communication skills that enable the student to explain his or her work to people from a wide variety of backgrounds.
- g. To be able to report scientific results. *Criteria:* performance in technical writing course, senior thesis, and/or senior seminar.
- h. To be able to explain science to nonspecialists. *Criteria:* performance in tutoring or teaching, if appropriate.
5. To develop the ability to adapt to new situations arising from the changing nature of science and technology.
- i. To be able to read original literature and to understand guest speakers. To be able to learn independently. *Criteria:* seminar presentations, term projects in advanced courses, performance in directed studies courses and/or senior thesis.
- j. To be able to think about physics in the context of the natural sciences. To gain exposure to interdisciplinary work. *Criteria:* performance in other science courses; performance in interdisciplinary teams.