

General Physics II (Physics 122)

Justification

1. One of the goals of this course is to familiarize students with empirical and theoretical methods of physics. This goal is achieved by (i) placing main concepts discussed in the course in their historical and methodological context, and (ii) designing the laboratory component of the course in such a way that, in every lab assignment, students emulate processes involved in empirical methods of knowledge creation in physics.
2. This course will provide students with a general picture positioning physics within wider field of natural sciences and larger society through a variety of means. First, students will be required to read additional texts of more general nature discussing historical, economic, and cultural background of physics discoveries studied in class. Second, lectures and recitations will use examples from adjacent disciplines and technological applications of studied concepts as illustrative material and practical problems. Third, students will be given special assignments such as participating in mini-symposia, or clicker based quizzes thus reinforcing students' understanding of societal and technological role played by the studied area of physics.
3. The course covers all of the material considered standard for Algebra-based introductory physics courses and also satisfies the MCAT and other health profession test requirements. Through the combination of recitations, labs and homework assignments, students receive training enabling them to use this knowledge in upper level courses.
4. The students are also exposed to how progress is made in science for example how new discoveries are made based on older ideas.
5. The structure of labs in the course stimulates students to actively engage in obtaining empirical knowledge regarding concepts and phenomena discussed from a theoretical point of view. Required participation in mini-symposia involves
6. Students might be assigned to read excerpts from original work of such authors as Stephen Hawking (On the Shoulders of Giants) and Richard Feynman (Pleasure of Finding Things out) at the discretion of instructor.

Assignments

Compulsory assignments:

Reading assignments include reading regular textbooks as well as additional literature as determined by instructor. Additional reading will include books on history of physics and its philosophical and technological role, biographies of scientists.

Problem solving assignments involve solving at least 15 problems per week

Additional assignments at the discretion of an instructor:

Quiz based on reading of historical and societal context material relevant to the course.

Assessment

Learning outcomes will be assessed in the course through a variety of means. First, students will be given three “mid-term” exams and a final exam, which will test students knowledge of concepts studied in the course, their ability to apply the concepts to practical problems, their understanding of historical context of the studied discipline and its role in development of society.

Second, Department of Physics traditionally conducts a survey of students’ opinion about courses taken at the Department; in the case of this course, the survey will be modified to reflect its PLAS designation. Third, at the end of the semester students might be asked, if practical, (at the discretion of instructor) to take a clicker based quiz to test the students understanding of the historical and societal context of the subject matter.

Administration

The curriculum committee of the department will be in charge of designing, implementing and assessing learning outcomes of all PLAS courses. The chair of the committee will be in charge of the process. The course will be taught primarily by full time faculty. The curriculum committee will develop a unified curriculum for the course and oversee its actual implementation. The curriculum committee will also review and approve all final exams given in this course.