

Assessment: Assessment Plan

Degree Program - AS - Physics (BS)

CIP Code: 40.0801.00

Degree Program Coordinator: Alessandra Corsi

Degree Program Coordinator Email: Alessandra.corsi@ttu.edu, melanie.ungar@ttu.edu

Degree Program Coordinator Phone: 806-577-6420

Degree Program Coordinator Mail Stop: 1051

Program Purpose Statement: Assess learning outcomes in majors courses, and assess overall program condition and direction.

Assessment Coordinator: Melanie Ungar@ttu.edu

Modality: Face-to-Face

Student Learning Outcome: Problem-solving skills competence

Students will be able to analyze and solve a wide variety of physics problems, utilizing their conceptual knowledge base and appropriate mathematical approaches

Outcome Status: Active

Outcome Type: Student Learning

Start Date: 06/15/2015

Assessment Methods

Portfolio Review - Undergraduate advisors will monitor Instructor assessments and see that 80% of the majors have satisfactorily mastered key problem-solving based on valid concepts in the junior/senior classes. Faculty will evaluate term papers written by majors in the junior/senior courses and evaluate reports written for the laboratory courses. Undergraduate advisors will receive scores on the GRE by those students who go on to graduate school. (Active)

Criterion: 80% mastery of key concepts in the junior/senior classes, and their applications to problem solving, and as shown in homework, class exams, term papers, and lab reports. 80% of GRE scores of 670 or better will be expected.

Schedule: Students will undergo this assessment in their final year before graduation.

Course Level Assessment - Individual instructors in the courses excepting PHYS 1408 (Principles I) and 2401 (Principles II) will keep records separate from grades judging each student problem-solving competence. An overall course score ranging from 4 (excellent), 3 (very good), 2(average), 1(poor), and 0(unacceptable) will be assigned to each student on a course-by-course basis. (Active)

Criterion: A score of 2.8 (above average) or better will be expected for each of these courses.

Schedule: Each long semester that a course is offered.

Student Learning Outcome: Conceptual learning and integration

Students will demonstrate a knowledge of the major concepts of the different fields of physics and their integration into the common conceptual basis of the physical view of the world.

Outcome Status: Active

Outcome Type: Student Learning

Start Date: 06/15/2015

Assessment Methods

Degree Program - AS - Physics (BS)

Course Level Assessment - Conceptual questions will be embedded in pretests or early examinations in key upper level courses, and substantially similar questions will appear in comprehensive finals. Improvement in the responses to these questions will be expected. (Active)

Criterion: 75% of the students in the selected courses will show significant improvement in their conceptual understanding over the semester of the class. Significant improvement will be defined as 20% improvement.

Schedule: Early period and end of course for selected classes each semester they are taught.

Capstone Assignment/Project - Student in their last semester before graduation will take a mandatory concept inventory test created by the undergraduate affairs committee, covering the full range of topics encountered in the introductory and upper level courses. (Active)

Criterion: A score of 75% or better when averaged over the student results will be judged to be successful.

Schedule: The test will be administered in the last month before the student graduates.

Student Learning Outcome: Ability to communicate physical results orally and in written form

Students will be able to effectively report on the results of physical experimental or theoretical results, using acceptable standard formats both in oral presentations and written reports.

Outcome Status: Active

Outcome Type: Student Learning

Start Date: 06/15/2015

Assessment Methods

Oral exam - Several upper level courses will be chosen each semester in which each student is required to give an oral presentation of a current topic in physics or an oral report on an experiment. As motivation for the students, these presentations should be used as a portion of their course grade. (Active)

Criterion: The instructor will judge the presentations as satisfactory or unsatisfactory, based on student achievement of correctness of physics and clarity of presentation. 75% of these reports being judged satisfactory will be considered success.

Schedule: Late during each long semester.

Essays - Lab reports produced in the experimental classes 3304 and 3401 will be assessed for clarity, and student ability to communicate physical results and ideas. These assessments will be recorded separately from the overall grades assigned to the reports. The assessments will judge these abilities as satisfactory or unsatisfactory. (Active)

Criterion: 75% satisfactory results will be considered success.

Schedule: annually, with 3401 assessed in the Fall semesters and 3304 assessed in the Spring semesters.

Student Learning Outcome: Capstone assessment of overall learning outcomes

In their final year of studies, the students will be expected to demonstrate an adequate degree of conceptual, theoretical, and experimental understanding through several possible avenues

Outcome Status: Active

Outcome Type: Student Learning

Start Date: 06/15/2015

Assessment Methods

Degree Program - AS - Physics (BS)

Capstone Assignment/Project - Students will complete either a theoretical or experimental study of their own devising (under the supervision of a faculty member), and write a detailed report in the style of a scholarly article. This could be done as PHYS 4306 (Senior Project), or as results of an external research project such as an REU project. (Active)

Criterion: The student's work will be evaluated as satisfactory or unsatisfactory by the undergraduate advisor or another faculty member designated by either the chair or the advisor. A goal of 75% satisfactory performance will be considered as successful results.

Schedule: Activity will occur in the student's final year before graduation.

Portfolio Review - The instructors will maintain a portfolio of each student's work in each individual class from Physics 2402 through all higher level classes. The portfolio will include representative work turned in by the student including selected homework, reports, exams, and general observations on the student's performance. This portfolio will be reviewed by the academic advisor or another designated faculty member for quality of work. (Active)

Criterion: A student's portfolio should show acceptable understanding of physical concepts, theoretical bases of the various upper level courses, experimental expertise when applicable, and communication skills. Success will be considered to be 75% acceptable results.

Schedule: This review would occur during the student's last semester before their graduation is anticipated. The option of portfolio compilation will be presented to students beginning in the Fall semester of 2015