Annual Assessment Report
Department of Physics
16 July 2018

Narrative of Strength

On March 1, 2018, the Assessment Committee provided positive feedback on the department's 2016-2017 assessment report which highlighted our work assessing our introductory physics courses. We would summarize this work as follows:

> As part of the preparation for a new introductory physics sequence (Workshop Physics), the department instituted a regime of pre- and post-test assessment of the introductory physics curriculum. At the beginning of each semester, we administer a pair of conceptual and attitudinal surveys to every student enrolled in an introductory physics section. We administer the same pair of surveys again at the end of the semester. Analysis of survey responses provides the department with a measure of student learning that is independent of formally graded assessments. The surveys employed have been formally designed, tested, and verified by the Physics Education Research community.

Action Plan for Improvement

The Department of Physics will use the results of the pre- and post-test assessment of the introductory physics curriculum. Specifically, we will:

- compare the results for student gains on the content surveys to the depatment's understanding of student gains as measured by more conventional instruments of assessment like final exams,
- explore the causes of any effects on gains, i.e. examining whether any effects on gains are explained best by the format of the course or the content/text, and
- determine if the results suggest that changes to the assessment instruments is needed.

Furthermore, the Department will be undergoing an external review in 2018 in which we expect to reexamine our departmental learning goals. Presently our capstone exam follows from the department's third learning goal: "To provide physics majors with an in-depth study in the field of physics." Specifically, the exam assesses subparts (a) and (b) of that learning goal:

> *3a. [Physics majors should have] a clear understanding of the experimental basis of all fundamental physical theories. They should understand the major theories and be able to explain how they follow from experimental results.*
>
> *3b. [Physics majors should have] a panoramic view of the field of physics with enough detail to enable them to easily make connections with new information in physics, and thereby more readily assimilate new information.*

We expect that our self-study will prompt us to revise our learning goals and reexamine how a capstone best helps us achieve those goals for our majors.

Resources

The benefits of a workshop format are well-established in the Physics Education Research literature, but to accomplish our assessment goals for the year our department will to need review recent work in the field to determine whether our instruments best assess the *content* of introductory courses.