

# University of Dayton Physics Assessment Report

## August 15, 2011

The following assessment report is built around the Physics Assessment Plan submitted May 2010. The report will go over the outcomes and measures and assess how physics did or did not achieve the assessment goals for our physics majors. The parts of the report in regular type are from the Physics Assessment Plan and the parts of the report in **blue** italics are for this Physics Assessment Report. The parts in **red** italics will present strategic changes for the coming years to improve our assessment efforts.

### Physics Assessment Plan - May 15, 2010

The following assessment plan is for UD physics majors.

Our exit interview form has been changed to reflect the measures of the outcomes listed below. It is our plan to collect and analyze the measures with the 2011 graduating class. *One of the issues with doing a form based exit interview is making sure that you get back the form with the exit interview information. We had six graduates this year and we only received three exit interview forms even though we requested the forms from the graduates multiple times. The exit interview will be done during one on one meetings with the graduates rather than via email.* Based on these results, we will make changes to our program during the 2011-2012 academic year to better implement the outcomes. We will again collect and analyze the measures with the 2012 graduating class. At this point we will see if we need to make modifications to our assessment plan.

**HIR outcome - Scholarship:** All undergraduates will develop and demonstrate advanced habits of academic inquiry and creativity through the production of a body of artistic, scholarly or community-based work intended for public presentation and defense.

For the physics department, the following outcomes reflect this Scholarship learning outcome.

**Physics Scholarship Outcome 1:** The physics major will present physics research in public forums.

Measure 1: Before graduation, 75% of our physics majors will present research in current physics areas at the Stander Symposium. *Even though only three of six graduates returned the exit interview form, we know that five of the six graduates presented their work at the Stander Symposium.*

Measure 2: All physics majors will do final presentations (10 to 15 minute talks) of Advanced Laboratory projects. *We know that all of the graduates presented talks in their advanced laboratory courses.*

Measure 3: All of our graduating students will answer Strongly Agree or Agree to question 7 (You have made formal oral presentations in laboratory coursework, research projects, or teaching projects.) on our physics department exit interview. *Two of the three responding graduates Strongly Agreed, and one Agreed.*

**Physics Scholarship Outcome 2:** The physics major will acquire knowledge in the core physics curriculum that will allow him/her to succeed in a program of advanced study or in the workplace.

Measure 1: Of those physics majors wanting advanced degrees, 80% will gain admittance to graduate or professional school. Of those wanting employment, 80% will be employed in a technical field within three months after graduation. *Even though only three of the six graduates returned the exit interview, we know that five of the six graduates (83%) will be going to graduate school next year.*

Measure 2: 75% of those physics majors applying for undergraduate research experiences, internships, or co-op experiences will be accepted into these programs. *We have less information about these experiences. Our exit interview does not directly get at this information. I do know that five of the six graduates were involved with REU type programs while UD undergraduates. The exit interview will be changed to directly request information about undergraduate research experiences, internships or co-op experiences.*

Measure 3: All of our graduating students will answer Strongly Agree or Agree to question 2 (You have the knowledge in the core areas of your major that will allow you to succeed in graduate school or in the workplace.) on our physics department exit interview. *The three respondents all Agreed with this statement.*

**Physics Scholarship Outcome 3:** The physics major will have multiple experiences in writing technical reports.

Measure 1: All of our graduating students will have taken PHY210L, PHY211L, PHY430 and PHY431 all of which require formal laboratory reports. *All of the physics majors had all of these laboratory courses. However, one of our graduates was a physics/computer science major and their requirement is not the same. The exit interview will be changed to reflect the requirements of all three of our physics majors: Physics, Physics/Computer Science and Physical Science.*

Measure 2: 50% of our physics majors will do an honors thesis. *Four out of six graduates (66%) did an honors thesis.*

**Physics Scholarship Outcome 4:** The physics major will be skilled in using modern laboratory instrumentation.

Measure 1: All of our graduates will answer Strongly Agree or Agree to question 3 (You can use modern instrumentation.) on our physics department exit interview. *Two of the three respondents answered Strongly Agree or Agree. One answered disagree. The exit interview process will need to be modified so that more in-depth feedback can be generated. For example, if the answer is Disagree, follow up with, “Why do you disagree with this question and how can we make this outcome a reality.”*

Measure 2: 50% of our graduates will have done a research project or honors thesis using laboratory instrumentation. *Four of our six graduates did research using laboratory instrumentation.*

**HIR outcome - Critical Evaluation of Our Times:** Through multidisciplinary study, all undergraduates will develop and demonstrate habits of inquiry and reflection, informed by familiarity with Catholic Social Teaching, that equip them to evaluate critically and imaginatively the ethical, historical, social, political, technological, economic, and ecological challenges of their times in light of the past.

For the physics department, the following outcome reflects this Critical Evaluation of Our Times learning outcome.

**Physics Critical Evaluation of Our Times Outcome:** The physics major will understand how science (and physics in particular) has influenced, and will continue to influence, human problems such as energy, environment and sustainability.

Measure 1: All of our graduates will have successfully completed the introductory physics sequence where these issues are presented and discussed from a scientific viewpoint. *All of our graduates did complete the introductory physics sequence. However, there is no real measure of whether these issues were uniformly presented across the instructors who taught these introductory courses. We will add a question to the exit interview to assess whether the graduate felt that the introductory physics courses gave them information about the human problems of energy, environment and sustainability.*

Measure 2: All of our graduates will answer Strongly Agree or Agree to question 9 (You understand how physics relates to human problems such as energy, environment and sustainability.) on our physics department exit interview. *The three exit interview respondents all Strongly Agreed or Agreed to question 9.*

***HIR outcome - Community:*** A Catholic and Marianist university is specially committed to the ideals and responsibilities of community in the design and delivery of its common academic program. These ideals and responsibilities are powerfully conveyed through the concept of “family spirit.” The common academic program should reveal a community of learning dedicated to challenging itself to realize the highest academic and ethical standards and to supporting its members fully in this challenge.

For the physics department, the following outcome reflects this Community learning outcome.

**Physics Community Outcome:** The physics major will have had multiple experiences in living and working in groups.

Measure 1: All of our graduates will answer Strongly Agree or Agree to question 10 (You used the Physics Student Room to work and study with the community of physics majors.) on our physics department exit interview. *All three of our exit interview respondents Strongly Agreed with question 10.*

Measure 2: All of our graduates will answer Strongly Agree or Agree to question 11 (You participated in non-physics related student organizations while at UD.) on our physics department exit interview. *The three exit interview respondents all Strongly Agreed or Agreed to question 11.*

***HIR outcome - Vocation:*** Education in the Catholic and Marianist traditions strives to support academically students’ efforts to find and explore the deep purposes that lend meaning, wonder, and fulfillment to their lives. These purposes consist not merely in what students may find themselves especially fit for pursuing but in what each student is specially called to do. The university’s commitment to support students’ discernment of their vocations in academically appropriate ways follows from the fundamental objective to educate whole persons, in mind, spirit, and body, for whole lives.

For the physics department, the following outcome reflects this Vocation learning outcome.

**Physics Vocation Outcome:** The physics major will understand the responsibilities of being a scientist.

Measure 1: All of our majors will have taken the ASI-150 section for physics majors where they will have discussed what it means to do science and to be a scientist. *All six of our graduates took the ASI-150 course from Dr. Berney who does include information about science, about physics in particular and about the responsibilities of being a scientist.*

Measure 2: All of our majors will answer Strongly Agree or Agree to question 8 (You were involved in a research project.) on our physics department exit interview. *The three*

*exit interview respondents all Strongly Agreed or Agreed to question 8. Question 8 on the exit interview does not really get to the heart of physics research as a vocation. This question either needs revision, or another question about physics as a vocation needs to be added.*

*In conclusion, several aspects of the assessment process need to be refined. The exit interview form will be modified to include the changes already mentioned above. The exit interview process will be modified to insure that all graduating students complete the interview. A formal discussion of the exit interview results between the graduate and the department chair will be instituted.*