Departmental and Program Assessment
Annual Assessment Plan Report

Academic Year: **2008-2009**

Academic Unit: **Physics**

Chair: **Ann Wright**

Assessment Plan

- Is there an assessment plan for your department, program, or general education component? (It should be on the web at http://www.hendrix.edu/academics/academics.aspx?id=7264. If not, provide a timeline that will produce a plan by the end of the next academic year.)

  yes

- Does the assessment plan include stated student learning goals? (Goals should be able to stand alone as a list without pages of explanatory commentary. If not, provide a timeline that will produce goals by the end of the next academic year.)

Yes. The goals are:

- **To provide science and non-science students with an introduction to both the methodology of the physical sciences and the major models of reality developed in the physical sciences.**
  - **To provide all students with opportunities to understand and practice the methodology of the physical sciences.**
  - **To provide students with a grasp of the historical development of models of the physical world, the experimental basis of these models, and how these models have impacted how humanity views reality.**
- **To provide Biology, Chemistry, Physical Chemistry, Biochemistry/Molecular Biology and Mathematics students with the background in theoretical and applied physics necessary for their chosen field of academic specialization.**
  - **Biologists and Chemists need to understand the physical laws of mechanics, electrodynamics, thermodynamics, and atomic physics that are crucial to their disciplines.**
  - **Mathematicians need to see how mathematics is applied to the description of natural phenomena.**
- **To provide physics majors with an in-depth study in the field of physics. Including:**
  - **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.**

- **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.**
- **Undergraduate research. We feel that students don't really understand the nature of the field of physics until they have practiced it, reported their results at a meeting involving students from other institutions, and compared the quality of their work with that of students at other institutions. Since we consider ourselves a national liberal arts college, this comparison should be at the national level.**

- Does the assessment plan include a list of assessment data that are collected each year? (Assessment data lists should be able to stand alone as a list without pages of explanatory commentary. If not, provide a timeline that will produce a list by the end of the next academic year. You do ***not*** need to submit any of your data, but it should be on file in your department.)

Yes. The data collected each year include:

- **course syllabi are maintained for all courses offered**
- **samples of final examinations, laboratory reports, and student papers are maintained,**
- **grades assigned to students,**
- **student evaluations of course content and value,**
- **senior comprehensive examination,**
- **student presentations at national meetings,**
- **Exit interviews**
- **success of graduates in obtaining graduate school acceptances, assistantships, or employment.**
- **student performance on standardized tests such as MCATs and GRE Physics test.**

- Has your department or program done an assessment audit of your courses to determine how course goals match overall student learning goals? (This has not been required of departments, but it is a recommended exercise. If you have done this, please report the results.)

  no

- Are student learning goals available to students? Are student learning goals included in course syllabi in your department or program?

Yes. Department goals are posted on the web at http://www.hendrix.edu/academics/academics.aspx?id=7264. Student goals are included in course syllabi for all courses in the Physics Department.
Student Assessments

- Describe which *direct* assessments in your assessment plan have been collected for the year and which have not. ["Direct" refers to evaluated student work.]

Collected:

- **course syllabi for all courses offered**
- **samples of final examinations, laboratory reports, and student papers are maintained,**
- **grades assigned to students,**
- **senior comprehensive examination,**
- **student presentations at national meetings,**
- **success of graduates in obtaining graduate school acceptances, assistantships, or employment.**
- **student performance on standardized tests such as MCATs and GRE Physics test.**

Not collected:

none

- Describe which indirect assessments in your assessment plan have been collected for the year and which have not. ["Indirect" refers to student surveys or opinions.]

Collected:

- **student evaluations of course content and value,**
- **Exit interviews**

Not collected:

none

Assessment Planning

- How is information about student learning shared and used for department, program, or general education component decision making? (Each unit is to have discussions of at least two hours each academic year to discuss assessment. If you have met, briefly summarize the meeting. If you have not met, when do you plan to meet?)

The Physics Department met to discuss assessment issues during the 2008-2009 year:

- **3/17/09 Wright attended a college meeting on assessment and then shared results with dept. members immediately after.**
- **Feb 2009 Traig Born performed an audit on department assessment data. All missing data (syllabi, sample tests, etc.) were collected and filed.**
- **July 2008 Discussion of content of General Physics courses.**
- **October 2008 Discussed change of course equivalents for AP Physics exams. Submitted changes to curriculum committee, changed appropriate catalog pages.**

- **October 2008 Discussed how to strongly encourage majors to take GRE test for capstone. This year, 4 students submitted GRE scores to the department.**
- **January 2009 Met to discuss results from fall GRE scores. Adjusted grade equivalent for capstone to reflect nationwide trends in GRE scores.**

- Describe any curricular or other programmatic changes that have been made that were based (at least in part) on the availability of your assessment data.
    - **new pre-requisites were listed in the catalog after being approved last year.**
    - **Changed AP course equivalents for Physics courses**
    - **Adjusted grade equivalent for capstone to reflect nationwide trends in GRE scores.**

- Describe any changes in the Assessment Plan that have been made during this academic year. (If changes have been made, please submit an electronic copy of the revised plan to Amanda Hurd.)

none

- What are the plans for improving student learning in your unit?

    1. **We plan to submit a request for adequate faculty teaching coverage during Wright and Dunn's upcoming sabbaticals, plus long-term plans for Dunn's retirement. Having a new faculty member will allow us to keep class sizes small, to offer Topics courses, and offer more research experiences.**
    2. **We plan to examine the course goals and content for PHYS 305 Waves and Vibrations.**
    3. **We plan to examine the course emphasis and content for PHYS 315 Modern Physics.**
    4. **We plan to revise the exit interview process.**
    5. **We plan to examine the senior capstone experience.**

- Report on this year's action item for your unit.

The following goals were completed:

1) **(assessment goal #3) Modify pre-requisites for upper level courses? Some students are having trouble fitting all four upper level courses into their schedule because ¾ are offered every other year. By allowing students to take Modern Physics and Thermodynamics before they complete Waves and Vibrations, the problem is greatly reduced. These curriculum changes will be submitted in Fall 2008: remove PHYS 305 as pre-req for PHYS 315 and PHYS 370. Make PHYS 305 a co-req instead of a pre-req for PHYS 380. Change pre-req for PHYS 330 to PHYS 315 or CHEM 310.**

outcome: changes have been made.

2) (assessment goal #2) Assess the content of the General Physics courses.

outcome: changes have been made.

3) (assessment goal #2) Discuss the possibility of moving General Physics courses to a studio format.

outcome: we cannot support this change until we have more faculty members in the department.

4) (assessment goal #1) Development of a new natural science course on the topic of alternative energies and sustainability.

outcome: Wright is pursuing external funding to support the development of this new course.

5) Define at least one action item for your unit that will be a goal of your assessment discussions next year?

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2. **We plan to examine the course goals and content for PHYS 305 Waves and Vibrations.**
3. **We plan to examine the course emphasis and content for PHYS 315 Modern Physics.**
4. **We plan to revise the exit interview process.**
5. **We plan to examine the senior capstone experience.**