**Physics Department Assessment Report SP13**

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**College Physics I and II**, PH1703 and PH1803, and their associated laboratory courses PH1712 and PH1812, are studies of Newtonian mechanics, properties of matter, thermodynamics, and electricity, magnetism, light, atomic physics, nuclear physics, and quantum physics. College Physics is geared toward students in the engineering technology, medical and technical fields, and is not recommended for math, physical science, or engineering students. The prerequisite for College Physics I is a minimum grade of "C" in MT1505 (Pre-Calculus). Students must co-enroll in both lecture and laboratory courses.

The success and withdrawal rates for PH1703 are shown in the graph at left for academic years 2010-2012. The pie charts below compare grades in prerequisite MT1505 (Pre-Calculus I) to each student’s grade in PH1703.

Sample size- 26 students

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| --- | --- |
| MT1505 grade | PH1703 success rate |
| A | 88.9% |
| B | 93.8% |
| C | 94.1% |

Sample size- 10 students

Although PH1703 is a prerequisite for PH1803 (College Physics II), not all degree programs require both courses which leads to low enrollment. The success rate for PH1803 was 100% (defined as a grade of A, B, or C), for academic years 2010 and 2013. The sample size of 10 students may be too small to draw any meaningful conclusions. In the future, it may be useful to analyze degree completion rates compared to success in both PH1703 and PH1803, as well as the success rate in PH1803 compared to the students’ respective grades in PH1703.

## Interpretation of Results

The most striking result is the low number of students enrolled in College Physics. This appears to be due to two factors; the low enrollment in programs which feature College Physics as a degree requirement, and students choosing other courses for a nonspecific degree requirement for a science course.

Due to the low sample size, grades in prerequisite math courses for College Physics may not indicate any meaningful conclusions.

Success rates in College Physics may not be meaningful due to the low sample size, but the extremely low enrollment allowed an unusual amount of individual attention to each student, which could account for the unusual success rate.

## Assessment Plan: PH1703/1803

In light of the data, the department has set the following goals for the academic year 2013 – 2014:

* Integrate more laboratory sessions into the curriculum beginning Fall 2013.  Assessment of the lab reports will promote better scientific reasoning and deduction skills, and writing skills.  Knowledge of associated classroom material can be assessed for an increase in understanding.
* Analyze final exams in PH1703/1803 and pre/post test data to compare successful versus unsuccessful students to help isolate particular skill and concept areas that separate successful and unsuccessful students. This can begin with the data from the Fall 2013 semester.
* Continue in the fall of 2013 to focus on enrollment numbers from within the college by promoting College Physics to students as an interesting and useful course to fulfill the science requirement for their degree program.
* Continue in the fall of 2013 to focus on enrollment from outside the college by promoting degree programs which require College Physics.
* Begin to monitor the success rates in degree programs for students successfully completing PH1703/1803, starting with students who completed PH1703 in Fall 2012.

**General Physics I and II**, PH2103 and PH2203, and their associated laboratory courses PH2112 and PH2212, are studies of the mechanics of solids, liquids, and gases; and of heat and sound, and electricity, magnetism, and light. General Physics is intended for the student who plans to major in mathematics, the physical sciences, or engineering. The prerequisites for General Physics I are a minimum grade of "C" in MT1605 (Calculus I) and a minimum grade of "C" or co-enrolled in MT2105 (Calculus II). Students must co-enroll in both lecture and laboratory courses. The success and withdrawal rates for PH2103 are shown in the graph below for academic years 2010-2012.

Of the 69 students who enrolled in PH2103 between 2010 and 2012, the success rate was 84.1% (defined as a grade of A, B, or C), compared to a withdrawal rate of 13%. It may be useful to analyze degree completion rates compared to success in PH2103, as well as the success rate in PH2203 compared to the students’ respective grades in PH2103.

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| --- | --- |
| MT1605 grade | PH2103 success rate |
| A | 96.2% |
| B | 86.9% |
| C | 70.6% |

The table to the right shows success rates in PH2103 for each MT1605 grade. A higher grade in Calculus I relates to a higher success in Gen Phys I.

The success and withdrawal rates for PH2203 are shown in the graph at right for academic years 2010-2012.

Of the 55 students who enrolled in PH2203 between 2010 and 2012, the success rate was 76.4% (defined as a grade of A, B, or C), compared to a withdrawal rate of 15%.

PH2203 is a prerequisite for certain engineering courses such as EG2303 (Intro Circuit Theory), as well as being a degree requirement for several degree programs. In the future, it may be useful to analyze degree completion rates compared to success in both PH2103 and PH2203, as well as the success rate in PH2203 compared to the students’ respective grades in PH2103.

## Assessment Plan: PH1703/1803

In light of the data, the department has set the following goals for the academic year 2013 – 2014:

* Explore ways to increase collaboration to foster greater success through a possible engineering learning community or required study sessions beginning Spring 2014.  This would be assessed through attendance and success in class.
* Collect data from the comprehensive weekly Moodle quizzes showing student's understanding of the materials. Use this in combination with the pre/post test data to determine which material needs more attention.  The Moodle data can be collected by Dec 2013.  This will allow for syllabi changes in Spring 2014.
* The design projects will be modified to become a whole semester project rather than the last few weeks.  Students will be expected to go through a greater planning phase to replicate a more typical engineering environment. This was addressed in the Transfer Engineering Advisory Committee meeting as a much needed skill. Modifications to the design projects can begin in the Fall 2013 semester.  The final assessment of the projects will need to reflect these changes.