

Chapter 13: DISCIPLINE ASSESSMENT SPOTLIGHT

Each year, the Assessment Almanac contains one chapter dedicated to spotlighting the assessment practices of a specific discipline. It is intended to publicize the behind-the-scenes assessment work that goes on at Truman and to highlight the practices of one outstanding department. For 2012, the Physics Department is the focus of the Discipline Spotlight.

The Physics Department uses many types of assessment, but there are three measures that stand out as especially important. The most valued of these is the Senior Test. Every senior physics major takes the nationally normed Major Field Test (MFT). The department thoroughly examines and analyzes the results of the MFT each year. The results allow comparison of each student with average scores from the last few years. The department can also determine how Truman physics students did on the whole test compared to the nation, and on specific sections of the test compared to the nation. These specific sections split the test into introductory and advanced question sections. Furthermore, the report gives an overall departmental score (not student by student) to compare Truman's physics department to other schools' on the whole test; subdivided by level: introductory versus advanced; and by subject: classical physics, electricity & magnetism, quantum physics, thermodynamics, and special topics. The department faculty meet together to compare the results to the previous year's results, and also keep a concise summary of past results over a long period of time. The department spends at least one entire physics department meeting per semester talking about the Senior Test.

The second most important assessment practice of the Physics Department is the interview of graduating seniors by the faculty. The night before reading day in the spring semester of every year, all students that will not be coming back the next spring are invited to an exit-interview led by faculty. It is an open interview, with no strictly specified agenda, which often leads to more informative and insightful student comments. Students give suggestions on changing the program or curriculum. The attending faculty members write up a report and circulate it to the rest of the department. One example of the interesting things they learn from these interviews is that students say they want more physics knowledge by way of more courses, but without more

stress. The department takes suggestions like these seriously, and tries to accommodate them whenever possible.

There is a third assessment practice of the Physics Department that stands out among the others: the Intermediate Physics Test, or IPT. Students take this test at beginning of their Modern Physics II class, which is in the spring of the sophomore year for most students. The test consists of just 5 or 6 classic introductory physics problems, and is thought of as a mid-course progress check. The department has been administering the IPT for 10-12 years. Development of the test was prompted partly by a university-wide initiative encouraging discipline specific assessments. At that time, there was concern in the department for students who were just barely getting by in their lower level physics courses, but who would eventually have difficulty in upper-level classes. Thus the test was created because the department wanted an earlier checkpoint so that students could have an opportunity to rethink their major or start improving their knowledge and skills before entering more challenging upper level courses. However, students tend to do poorly on the IPT, even though those same students later take the MFT and do very well. From this result, the Physics Department has learned much about how students learn physics. It seems that somehow between the sophomore and senior year, the students begin to really piece together and understand all the topics they have met in earlier courses. It seems that students simply may have to see the material several times to finally understand it. Always having low scores on the IPT is not the ideal situation, but the problems often get worked out before the time of graduation this way. In order to aid this process, students are required to talk through their test with their advisor in order to find what they may need to review. This embedded mid-course meeting between students and their advisors on matters of physics is a highlight of the IPT.

Other important components of the assessment practices used by the Physics Department are the Junior and Senior seminar classes and the Student Spy. The Junior Seminar class is designed to prepare students for the Senior Test and the graduate entrance exam. It is a one credit hour class, where 70% of the course is spent reviewing all of the Physics students have learned up until that point using GRE practice tests. The multiple-choice format of these important tests is one for which physics students typically have little experience, since testing in most Truman physics courses is largely based on solving problems. The seminar is also a place where students

develop first drafts of resumes and personal statements. Thus, this class helps the department make sure the students are prepared to apply for graduate school, or their first career. The Senior Seminar class is a capstone class that both BS and BA Physics majors must take. This class is the culmination of a student's research. Students write about and prepare to present their research experiences for the Student Research Conference. The Truman Portfolio is also administered in this class. The student spy is a member of the Society of Physics Students who comes to department meetings to give the faculty a student's perspective. This helps the faculty to tailor their methods of education to the students' needs and also gives the students an opportunity to find out what goes on at department meetings.

Physics, like all other departments, engages in a major program review every five years. It is a chance for the department to step back, reflect, and take a good look at data to see what areas of the curriculum are weak and what areas are successful, and to plan their goals for the next five years. The program review relies in part on Graduating Student Questionnaire data in its analyses. Some questions that are useful to the department are: How adequately has this major prepared you to apply your knowledge, to problem solve, and to think critically? How adequately are you prepared by your major to find and interpret information, and to understand multiple perspectives? The answers to these questions are then analyzed by the department.