

Minutes

for the Physics Department Assessment meeting
held on Monday, May 12, 2014 in UH168.

Present: Benjamin, Boukahil, Constantinescu, Nawash, Sahyun, Rybski, Yavuzcetin

Absent: None

- I. Benjamin called the meeting to order at 1:13 pm.
- II. Rybski/Nawash moved the approval of minutes of April 30, 2014 meeting. Motion passed.
- III. Old Business
 - a. No old business
- IV. New Business
 - a. *Review of Major Field Test Results.* The department reviewed the results of this year's major field test, administered to eight majors near graduation: Spring 2014 graduates David Carroll, Brian Chapman, Alexandre Fernandes, and Junxiang (Isaac) Xu, Fall 2013 graduates Martin Gostisha, Anthony Martinek, and David Torres, and Fall 2014 graduate Alex Fritzler. The total percentiles for these students (Figure 1) ranged from five to eighty-five, with a mean of $51.3 \pm 28.8\%$. Although it is difficult to interpret these averages with such a small number and large spread, this cadre did show marked improvement compared to previous years. This was the highest average since the 2007 class, and the number of students scoring about 50 percentile tied the 2007 record. An examination of the subscores showed that this cadre had higher "advanced" scores than "introductory" scores, a reversal from the trend of the past. A notable feature of this class is that a (record) three students are going to graduate school next year.

A breakdown of the score by subject category showed that our students are showing improvement in the areas of Mechanics/Relativity and Special Topics (Lab Techniques, Nuclear, Particle and Astrophysics). However, even this cadre appeared to be as weak as previous classes in the areas of Electricity and Magnetism, Optics/Waves/Thermodynamics, and Quantum/Atomic. This may be in part due to the fact that students tend to be taking some of these classes in their final year. However, as discussed below, the fact that Engineering track majors are not required to take E&M, Thermo, or Quantum, and the fact that Graduate track majors are not required to take Optics or Quantum may also be depressing these scores.

- b. *Review of Exit Interviews from Graduating Physics Majors.* Six graduates filled out a thirty-two (!) question exit interview and then sat for an in-person interview with the chair. The chair took written notes of the interview and shared the results with the whole faculty. (Student comments intended for individual faculty members were shared with those faculty before the assessment meeting.) The faculty reviewed the comments, searching for common themes or points that related to other elements of assessment data. The suggested changes are noted below.
- c. *Discussion of Changes to Departmental Exit Interview.* Benjamin noted that last year's audit and review resulted in a suggestion that the department better align the exit interview questions with the departmental student learning goals. He offered a set of questions to address these concerns. Discussion on these modifications were deferred to the start of 2014-2015 academic year.
- d. *Student Resumé review.* In Spring 2014, the department made the submission of an updated student resumé as part of the requirements for advising. Students enrolled in our intro seminar course Physics 190 (Frontiers of Physics and Engineering) were taught how to put together a resume, which were evaluated by the other students and instructors. Due to time, there was only limited discussion on the resumes, in particular whether information that was useful for the department (like career objectives) were desirable to include on the resumé since many students might not think to remove pieces of information intended for the departmental use only. A full review of the resúmes will take place at the beginning of the contract period in 2014-2015.
- e. *Discussion of Programmatic changes based on Assessment Data.* After reviewing the exit interviews and Major Field Test results, each faculty member was asked to pull out one item of importance, describe why it was important, and suggest a revision that could be made to our departmental procedures to address it. After each faculty member had a chance to bring out one point, other points of concern were shared. The following issues were raised:
 - i. *Sahyun* noted that many of the students did not take Optics, and noted that this produced a substantial gap in their knowledge, a point which appeared to be confirmed by Major Field Test scores and student reports from taking the Physics GRE. Currently, only engineering emphasis students take Optics, a course which is offered every other year. He suggested two changes: (1) offer Optics every year, and (2) also require graduate school

track students to take Optics. Because of a recent surge in enrollment combined with the popularity of the engineering emphasis, it looks likely that we will be able to offer Optics every year to our majors. One potential concern is that the second change might result in too many required physics credits for the grad school track; however it was noted that in our current curriculum, engineering emphasis majors are required to take ten additional credits of chemistry. However, the department agreed that overall this was a desirable change.

- ii. Nawash* noted the lack of student participation in summer programs for our recent graduates and suggested that two sessions of Physics 190 be set aside for this. The department agreed that this would be an excellent idea and that students be required to develop a list of programs/internships and be asked to prepare everything they need, including a personal statement. There were concerns about whether it was fair to ask a single instructor to review ~60 personal statements. Other faculty agreed to help review the personal statements.
- iii. Constantinescu* noted that some students felt that they had taken some of their classes in the wrong order, particularly the lab classes, where skills in one class build from material in a previous class. In particular, it was decided that the Intermediate Lab class be made a pre-requisite for all of the other lab classes in our departmental curriculum.
- iv. Yavuzcetin* noted that some students had noted that there was sometimes overlap in content between classes, and one graduate suggested that there be better communication among faculty members about what topics are covered in the different courses. While the department agreed wholeheartedly with the suggestions that communication about what gets covered in each course is important, it was thought that some amount of repetition/overlap was probably of benefit to many of our weaker students.
- v. Rybski* noted that graduate school emphasis students felt that Quantum Mechanics should be a requirement for graduation. The department noted that students commonly take this course anyway (and report positive experiences). The department agreed that so long as number of credits is not an issue this change should be made.
- vi. Benjamin* noted that several students were reporting issues regarding the coordinate of math and physics courses, with students taking the math well

after they cover it in physics or finding that the coverage of the math classes does not meet their needs. Benjamin and Boukahil agreed to create a *Calculus Diagnostic Exam* for majors starting the upper level courses, and Benjamin, Boukahil, and Sahyun agreed to start a dialogue with the Mathematics and Computer Science Departments on these issues.

vii. Several other issues were discussed, but with no action decided upon. This include the role of Static in our different emphases, problems produced by scheduling conflicts, the suggestion that the department hire another theorist, the possibility of an astronomy minor, the role of on-line homework in our curriculum, and the possibility of adding a second Quantum or Electricity & Magnetism course to our curriculum.

V. Announcements

a. Chair's Announcements

i. The chair announced that this would be the last meeting of the year and would keep the department informed about whether it would be possible to have personnel review, consultations, etc done after the start of contract period in the Fall but before classes. He also asked everyone to consider the curricular changes discussed at this meeting as these would be voted on at the beginning of the next academic year.

b. Sahyun announced that he had submitted a Summer Assessment proposal to develop assessment of student lab skills.

VI. Boukahil/Nawash moved to adjourn the meeting. Motion passed at 3:01

Attachments:

1. Plot of overall Major Field Test score vs. year
2. Plot of Major Field Tests scores broken down by category.
3. Summary of historical data for individual students on Major Field Test.
4. Exit Interview Results for 2013-2014 graduates
5. Collected student resumés of all physics majors.

Submitted by B. Benjamin, secretary of the day

Cc: Dean David Travis