

Memo

TO: Department of Physics

FROM: Christopher Beetle

DATE: April 11, 2011

SUBJECT: Summary of Recommendations of the Curriculum Committee

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The Department's Curriculum Committee has met several times during the present semester to formulate some changes to our undergraduate degree programs. The objectives of this proposal are to

- (a) eliminate several redundancies in course content,
- (b) ease students' transition from the State College system,
- (c) offer more elective credits to upper-division undergraduate majors, and
- (d) foster a stronger sense of community among our undergraduate majors.

The proposal comprises a number of specific measures. I list them here, each with a brief summary of the rationale for the change. They are:

1. Replace the advanced math requirement of Matrix Theory (MAS 2103, 3 ϕ) with the student's choice of Differential Equations I (MAP 2302, 3 ϕ) or Engineering Math I (MAP 3305, 3 ϕ). Change prerequisites as needed on all undergraduate physics courses to reflect this.

This is consistent with other universities' curricula in the State system.

2. Unify General Physics III (PHZ 2106, 4 ϕ) and Survey of Modern Physics (PHY 3101C, 4 ϕ) in a single, 4-credit, upper-division course to be taken Fall 3rd year. Stipulate that special relativity should be covered in the combined course.

There has been considerable redundancy in these courses due to a lack of clear distinction in the material to be covered in each. Also, no other university in the State system requires, or even offers, such a course.

3. Offer General Physics I (PHY 2048, 4 ϕ) in Fall 2nd year and General Physics II (PHY 2049, 4 ϕ) in Spring 2nd year.

This will avoid a one-semester gap in physics courses left by the elimination of General Physics III (PHZ 2106, 4 ϕ).

4. Unify Thermodynamics (PHY 3503, 4 ϕ) and Statistical Physics (PHY 4523, 3 ϕ) in a single 4-credit course focused primarily on statistical physics.

A second-semester statistical physics course will be offered as an elective. This will give students greater flexibility in their curricula.

5. Eliminate Quantum Mechanics II (PHY 4605, 3¢) as a required course, but continue to offer it as an elective in Spring 4th year.

Again, this will give students greater flexibility in their curricula.

6. Require students in the BS in Physics program to take 6 credits of upper-division elective courses. Offer electives on a rotating basis, including Statistical Mechanics II (PHY 4xxx, 3¢) and Quantum Mechanics II (PHY 4605, 3¢), but also other options. With Departmental permission, students may enroll in graduate-level courses to fulfill this requirement.

This will enable students to pursue topics of more direct interest to them, and also potentially at a more advanced level.

7. Require 4 credits of an Advanced Undergraduate Seminar (PHY 3/4xxx, 1¢) course, to be offered every semester. Topics to be covered will vary, but will include introductions to different research efforts in the department, a journal club, and guidance on building skills (application and resumé writing, LaTeX, Mathematica, presentations, scientific coding, scientific writing) needed in a scientific career.

The purpose of this course is twofold. First, it will foster a sense of community that currently is lacking among our undergraduate majors. Second, it will offer more support and encouragement to students contemplating the next step in their scientific career.

The Curriculum Committee consists of myself, Sukanya Chakrabarti, Andy Lau, and Dora Leventouri. We are eager to answer questions or hear concerns regarding these proposals. Some work remains to be done before these proposals can make their way to the College and University levels. In particular, while our primary focus has been on the BS in Physics program, we have not yet studied in detail the implications of these changes for our other degree programs. We hope to finish this work this semester and prepare a package of changes to go up to the College Undergraduate Curriculum Committee at their first meeting in the Fall.

Christopher Beetle
Chair, Curriculum Committee