October 28, 2009

IMPORTANT ANNOUNCEMENT
Physics 1a

Ph 1b and 1c will again be split into two tracks this year: "Practical" and "Analytical" (described below). Both will study electromagnetism, but they will have different lectures, sections, text, and procedures. You must choose one or the other by the beginning of winter term. We hope that as many of you as possible will be able to choose at Pre-reg (indicate either Ph 1b Practical or Ph 1b Analytical) to help us organize the sections.

ANALYTICAL TRACK

This track will be based on Purcell, a theoretically elegant E & M text that challenges our best prepared students, plus about four weeks of supplementary material on special relativity. The level and amount of homework will be higher on average than in Ph 1a.

PRACTICAL TRACK

In this track, the approach will be less abstract and more closely tied to the application of experimental phenomena, with emphasis on the most basic concepts. The text used will be Serway. Unlike Purcell, it uses familiar volts and amps rather than cgs units and does not use advanced mathematical operations such as div and curl, which are not encountered until Math 1c. Special relativity will be treated, but with somewhat less sophistication. There will be one lecture per week (mainly demos); sections will be increased to three per week and will therefore include derivations as well as the usual discussion, examples, and homework.

The lab course Physics 8 (see below) is a hands-on complement to Ph 1 b and c but is not required.

Students in either track can go on to major in physics and take Ph 12 (Ph 12 uses no div or curl or relativity). Both groups will be prepared as far as subject matter is concerned, though the Analytical Track will be more closely matched to Ph 12 in level of abstraction and complexity of homework problems.

The Analytical Track will have lectures and sections meeting at the same times as the present Ph 1. The Practical Track will utilize M,TH 1:00 PM or 3:00 PM time slots, plus one of the present lecture times (W 11:00 AM) for its three weekly section meetings. Its weekly lecture will be scheduled Fridays, 3:00 PM to 4:00 PM.

PHYSICS 8 b,c

Physics 8 is a course of experiments in electromagnetism open to students in either track of Ph 1. Its 3 units per term count toward the freshman lab requirement. It involves "take-home" labs: each student has a parts and tool kit, which is used to construct and perform experiments.

Previously, the content of Ph 8 and Ph 1 Practical had been incorporated into a single course. The separation now gives students greater choice and awards units more in line with the work required. The sequence of experiments is closer to the Ph 1 Practical sequence than Analytic, but Analytic students in the past have had no trouble understanding the material as needed to do the experiments as they come along.

Ph 8 offers direct, hands-on experience with the material of Ph 1b,c. The challenge and satisfaction of making things work and seeing phenomena first hand both reinforces learning Ph 1 and develops perspectives and skills essential to any experimental endeavor.

Making a Decision

Talk not only to your advisor but also to your section leader and to upperclassmen who experienced Ph 1 the past three years.

In the past we found that students in Ph 2a received just about the same grades independent of which track they had taken in Ph 1b,c, provided they started their freshman year in sections 3-8. Upperclassmen may tell you that students who took the Analytical Track had an easier time in Ph 2; we believe this impression has arisen because well-prepared students from sections 9 and 10 (who mostly take the Analytical Track) tend to have an easier time in Ph 2, whereas students from sections 1 and 2 (who mostly take the Practical Track) tend to have a harder time in Ph 2. When such

differences in preparation are factored out, there is no evidence that Ph 2 grades depend significantly on the track.

Some Hypothetical Cases

Student A had a very good high school course on E & M, is taking advanced math, and plans to major in Physics. The material in Ph 1a is so familiar that it has been boring. *This student would benefit from the Analytical Track, which approaches E & M from a different perspective than the high school course.*

Student B had little high school work in E & M, is taking Ma 1a, and plans to major in Biology. *There will be little use for div and curl, and the student has had little experience with things electrical and none with electronic circuits and devices. This student would benefit from the Practical Track. Also, the hands-on experience of the Ph 8 take-home labs will provide a feeling for electric circuits and electronic devices that will be used in later lab work and research.*

Student C had a good high school course on Mechanics but not on E & M, is doing well in Ma 1a, and plans to major in Physics or Applied Physics. *This student would benefit from either track. The challenging abstract work in the Analytical Track would help develop analytical ability, but the background in experimental phenomena in the Practical Track would give broad exposure and a better feeling for the subject.*

While these hypothetical cases have emphasized rational arguments that might influence your choice, you should also listen to your inner voice: which track will be most enjoyable, or present the most satisfying challenge, to you personally? No single stereotypical answer will apply to all Physics majors, or Biologists, or EE's. The answer is important, because you do best at what you enjoy.