Inquiry Into Physics

Physics 115 sec 0101
University of Maryland
Fall Semester 2007

Room: Physics 3316
Time: MTuW 10:00 AM to 11:50 AM
Instructor: Ayush Gupta
TA: Stephanie

When and Where can you find us?

I (Ayush) am always happy to meet you, but please do set up an appointment via email (ayush.courses@gmail.com) or phone (301-405-6184) or after a class. My Office is Rm 1320, Physics Building.

Stephanie's email is stefanie@krysiak.de

Credits etc.

There is no recommendation that you've had high school physics, no matter what it says on Testudo. You will receive four credit hours for completion of the course and may receive credit for only one of PHYS 115 or PHYS 117.

About this course:

The whole of science is nothing more than a refinement of everyday thinking.
Einstein, 1936.

Many students think learning physics means taking in information — facts and formulas and problem solving methods — and committing it all to memory. But, for Einstein and others, learning physics means refining your everyday thinking. And that means, first, becoming aware of your everyday thinking. They may not always think of what they're doing this way, but students who succeed in physics know this instinctively: Learning physics is as much learning about yourself, about how and what you know and see and think, as it is finding out new things about the physical world.

This is going to be our primary focus, learning how to learn physics: making observations in class, always starting with what you know from everyday experience and refining from there via discussions and individual reflection. Along the way we'll also talk about teaching science in elementary school, what it can and should entail. By the end of the course, I hope you'll be competent and comfortable with scientific inquiry.

To that end, you should expect class meetings will be made up mainly of discussions, experiments, and debates—don't expect to be sitting and taking notes on lectures. And be ready to do lots of writing, some during class but more on the homework.

Requirements

You're required to:

1) Attend the course meetings and participate in discussions and labs. There's no textbook; the content is what we do during course meetings. So you really need to be there.

2) Write and revise weekly assignments: In a typical week, you'll be starting a new assignment and revising one you've worked on before. I'll post the assignments on this web site and email them to you.

3) Read and comment on essay drafts and revisions by other students. In a typical week, you'll be reading each others' essays and writing comments on them.

4) Write out daily sheets and hand them in (details later)

4) Take an exam at the end of each unit.

Textbook and materials: There is no textbook for the course. There will be some readings as we go, which I'll distribute with photocopies in class or using this website.

Attendance:

Because of the critical importance of your participation to both your own learning and to the learning of your lab group and the class as a whole, I expect you to attend regularly. To encourage your regular presence attendance will be taken each day. More than two unexcused absences will affect your course grade. You must provide documentation for any excused absence (medical, religious etc.).

If you are late more than 15 minutes it will be counted as an absence. However, you will still be welcome to attend and profit from your work with the group. When you enter the class, you must check in with the instructor, and see that the instructor records your presence. It is your responsibility to make sure that your presence is properly recorded.

Grading:

I will base your course grades on essays, participation within group and in class, your lab notebooks, your daily sheets, and exams. As much as possible, I'd like to keep your attention on the substance of what we're doing rather than on grades. In the end, that leads to the highest quality of work. For this reason, I don't like to put grades on individual assignments, either as letters or as points. My experience is it distracts students from what this is all supposed to be about, learning science, not accumulating points. So you'll find lots of written comments on your assignments, but no summative letters or points.

I know this isn't what you're used to, and I'm happy to speak with you about it, including talking about your grade if you're concerned. I will score exams in the conventional way, and at midterm I'll hand out my estimate of your grade so far.

Exam Schedule:

	Date	Time
Exam 1	Oct. 1	Regular Class Hours
Exam 2	Nov. 5	Regular Class Hours
Exam 3	Dec. 19 (tentative)	8:00 am – 10:00 am (tentative)

Each exam will cover only the material from the previous unit.

Homework Assignments:

Homework assignments are usually essay type questions. You will be required to revise and resubmit assignments, as well as to read other students' assignments and offer them feedback. In most cases, the homework schedule will be as follows:

Monday	Wednesday	Thursday
'Fresh HW' due: one copies to me and each of your group members	You get the HW with comments from me and group members. The 'revised HW' will be due on following Monday	I post/email the 'fresh HW'. This will be due on Monday.
'Revised HW' from previous week due		

Lab Notebook:

There is no textbook for this course. Instead you will maintain a lab notebook that will serve some of the purposes of a textbook. It must be a three ring binder. In the notebook you should have lots of blank paper so you can record your observations, the observations of your peers, your ideas, the ideas of your peers, and the evidence for and against each idea. You should also include a copy of each homework assignment and your graded exams in your lab notebook. Please keep everything in order by date so that it's easier for me to comment on. Your notebook will be collected and commented upon twice during the semester.

It is important that you keep a careful and thorough notebook because you have no textbook. You will be allowed to refer to these materials during exams. Furthermore, you may find the notebook useful when you begin to teach science to your own students.

It is recommended that your lab notebook should be organized into three sections: Class Notes, Homework and Exams, and Daily Sheets (used and unused).

Daily Summary Sheet:

At the end of each class period I will give you a few minutes to fill out a daily summary sheet. These sheets will be turned in at the end of each class and returned at the following class meeting. They will be checked to verify you are completing them thoroughly. All of the returned sheets should be kept in your lab notebook.

Special Needs

If you have any special needs relevant to this course, please contact me so we can figure out the best way to accommodate them.

In fact, if you have any thoughts or concerns or suggestions at all, please let me know. I will be asking for feedback along the way, but you don't have to wait for me to ask. I may not do exactly what you ask, but I will definitely hear what you have to say and think about it.

Academic Integrity:

The integrity of your degree is important to me. Therefore I strongly support the Code of Academic Integrity of the University of Maryland. What does this mean in a collaborative environment like the one we have in this class? I expect you to consider yourselves a part of a learning community, so it is quite appropriate you seek help as you do your various assignments. In fact you will probably be most successful if you work with other students both in and out of class. This does not, however, mean identical reports are in order. You are expected to respond in your own unique style, even when the conclusions were reached through group efforts.

Education research

My research is in physics education — I am interested in how students learn and try to figure out better ways to teach. I'm hoping to use this course to collect data, which means I'll ask your permission to videotape class as well as to make photocopies of your written work. Whether or not you give me permission will have no effect at all on your grade or what we do in class.

I should say, though, that I'm not going to be "experimenting" on you with new techniques. The different approach we take in this course has lots of research and evidence already behind it; we're doing these things because we already know them to be much more effective than traditional instruction. On this as on any aspect of the course, please don't hesitate to speak with me.