PHYS 1610 – Fall 2014

Introductory Physics I: Mechanics and Special Relativity

MWF 9:00–9:50 AM, Room 204 JBL

Prof. Craig Group
rcg6p@virginia.edu
`http://people.virginia.edu/~rcg6p`
Phone at 113 HEP:(434) 243-5552
Office Hours: M 5-6, T 1:30-2:30, Room 302
      (W 10-11:30 by appointmtent)
(Note that my primary office is at the High Energy Physics Laboratory located on O-hill.
I plan to hold office hours in room 302 of the Physics building.)

Course Description:

The course goal is to attain an understanding of the foundations of classical mechanics, and a working knowledge of the subject in problem solving. The course consists of lectures, problem sessions, and weekly homework assignments. PHYS 1610 is calculus-based; therefore it exceeds the pre-med requirement, PHYS 2010. You should take this course (or PHYS 1425) if you are interested in majoring in Physics or if it is explicitly required by your major (e.g. astronomy, environmental sciences). This will be a challenging course in physics aimed at future scientists.

The homework assignments are an important supplement to the lectures. It is improbable that you will gain a passing proficiency in the course material without working out all of the homework problems on your own. You are encouraged to discuss problems with your colleagues however, you should work out the final solutions on your own. We will use Mastering Physics (Course ID: GROUP1610yr2014). However, in addition to submitting the HW online, you are also required to turn in a clearly written version of your work.

Corequisite(s): MATH 1310 Calculus 1

Teaching Assistant: Charlie Glaser, cjg8de@virginia.edu

Text: *Physics for Scientists and Engineers*, 4$^{\text{th}}$ Edition, Vol.1

Author: Giancoli;

Grade Distribution:

Two Midterm Exams	30%
Final Exam	35%
Homework	25%
Quizzes	8 %
Clickers	2 %

Tips:

1. Read related sections of the textbook **BEFORE** each lecture.
2. Show all your work in homework and exam problem solutions.
3. Check that your solution includes correct physical units (SI only!).
4. Make sure your solution makes sense (check orders of magnitude).
5. Give the smallest meaningful number of significant digits in your result, usually < 3.

Course Policies:

- **General**

  - You must have a UVa Collab account to access this courses web site (grades, info, teaching evaluations). The course web site should appear automatically in your Collab environment.

  - Problem sessions are designed to help you practice the course material using exercises and short problems, so as to prepare you for homework and exam problems. In addition, we will cover more advanced topics from time to time, going beyond the text- book. Note that some of the problems that were treated extensively during the problem sessions can constitute exam material.

  - Homework policy: Assigned problems will be announced at least one week before the set is due. No late homework will be accepted, except when arranged with the instructor in advance.

  - A short graded quiz will be given during most problem sessions.

  - There will be no makeup exams or quizzes. Except in emergency cases (e.g., sudden illness), a valid excuse for a missed exam can only be obtained before the exam.

  - Quizzes and exams are closed book, closed notes unless stated otherwise.

  - Computers are only to be used to take notes or supplement the discussion. If they become a problem, they will be banned.

  - We will use the iClicker2 in this course. You can purchase one at the UVa Bookstore.

  - Cell phone policy: All cell phones must be turned off before entering the classroom and stay off until the end of lecture, problem sessions, and exams.

  - Library Reserve: Many books that you might find useful can be found on the Physics 1610 reserve shelf at the Physics Library.

- **Attendance and Absences**

  - Attendance is indirectly taken via iClicker questions in each lecture and quizzes in the discussion section. Otherwise, attendance is up to you, but don't expect any favors from the professor if your attendance is poor.

  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Academic Honesty Policy Summary: I trust every student in this course to fully comply with all of the provisions of the UVa honor system. In addition to pledging that you have neither received nor given aid while taking your exams, your signature also affirms that you have not accessed any notes, study outlines, problem sets, old exams, answer keys, or the textbook, while taking a closed-book exam. Alleged honor violations brought to my attention may be forwarded to the Honor Committee. If, in my judgment, it is beyond a reasonable doubt that a student has committed an honor violation with regard to an exam, that student will receive an immediate grade of F for that exam, irrespective of any subsequent action taken by the Honor Committee.

Tentative Course Outline

Class	Date	Sections	Topic	Homework
		Kinetics		
1	W 8/27	Measurements and Units	Ch. 1	
2	F 8/39	One-Dimensional Motion	2.1-2.4	HW1 (Ch. 1)*
3	M 9/1	Falling Motion	2.5-2.9	
4	W 9/3	More One-D Motion	Ch. 2	
5	F 9/5	Two-Dimensional Motion	3.1-3.5	HW2 (Ch. 2)*
6	M 9/8	Projectile Motion	3.7-3.9	
	Tu 9/9	*(Last day to add a course.)*		
7	W 9/10	More Two-D Motion	Ch.3	
	W 9/10	*(Last day to drop a course.)*		
		Dynamics		
8	F 9/12	Newton's Laws	4.1-4.5	HW3 (Ch. 3)*
9	M 9/15	Using Newton's Laws	4.6-4.8	
10	W 9/17	More Using Newton's Laws	4.6-4.8	
11	F 9/19	Friction	5.1	HW 4 (Ch. 4)*
12	M 9/22	Curcular Motion	5.2-5.4	
13	W 9/24	More Circular Motion	5.4-5.6	
14	F 9/26	Examples	3-5	
15	M 9/29	More Examples	3-5	HW 5 (Ch. 5)*
16	W 10/1	More Examples	3-5	
17	F 10/3	Midterm Exam I	Ch. 1-5	
18	M 10/6	Work and Energy	7.1-7.3	
19	W 10/8	Kinetic Energy	7.4	
20	F 10/10	Conservation of Energy	8.1-8.4	HW 6 (Ch. 7)*
	M 10/13	*(Reading Holiday – no class !)*		
21	W 10/15	More on Energy	8.5-8.9	
22	F 10/17	Linear Momentum	9.1-9.4	
23	M 10/20	More Momentum	9.5-9.7	HW 7 (Ch. 8)*
	Tu 10/21	*(Last day to withdraw.)*		
24	W 10/22	Center of Mass	9.8-9.10	
25	F 10/24	Rotational Motion	10.1-10.4	HW 8 (Ch. 9)*
26	M 10/27	Rotational Dynamics	10.5-10.10	
27	W 10/29	More Rotational Dynamics	10.5-10.10	
28	F 10/31	Angular Momentum	11.1-11.2	HW 9 (Ch. 10)*
29	M 11/3	More Angular Momentum	11.3-11.9	
30	W 11/5	Examples	7-11	HW 10 (Ch. 11)*
31	F 11/7	Midterm Exam II	7-11	
		Statics		
32	M 11/10	Statics	12.1-12.4	
33	W 11/12	More Statics	12.5-12.7	
		Special Relativity		
34	F 11/14	No Class (SESAPS)	NA	HW 11 (Ch. 12)*
35	M 11/17	Intro to Special Relativity	36.1-36.3	
36	W 11/19	Simultaneity and Time Dilation	36.4-36.5	
37	F 11/21	Lorentz Transformations	36.5 and 36.8	
38	M 11/24	Relativistic Momentum and Energy	36.9	
	W 11/26	*Thanksgiving Holiday – no class!*		
	F 11/28	*Thanksgiving Holiday – no class!*		
39	M 12/1	Mass and Energy	36.11	
40	W 12/3	Experiment and Impacts		HW 12 (Ch.36)*
41	F 12/5	Examples	1-5,7-12,36	
42	M 12/16	Final Exam (2-5PM)	1-5,7-12,36	

* All HW due at 11:59 PM.