PHYS121: Fundamentals of Physics I – Fall 2013
Sections 0201-0204 – Professor Buehrle

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Physics is a science which attempts to unify elements of the natural world by means of observation, mathematics, and the use of precise language. Using methods developed by physicists, we can describe many events that occur in our everyday lives. The principles of physics provided a basis for most of the technologies that are an essential part of modern life. In this sense, physics is *practical*. Many laws developed by physicists, such as the law of conservation of energy, are of tremendous practical importance. These same laws also help physicists understand the very tiny constituents of matter as well as the motions of giant clusters of galaxies. Thus the study of physics helps us understand some fundamental relationships between the matter in our surroundings and the evolution of the universe. In this sense physics is *profound*. In PHYS 121, you begin your own exploration of the natural world using some of the concepts, tools, and methods commonly employed by physical scientists. PHYS121 deals with motion of particles and rigid bodies with in small and large systems.

Lecture: Monday, Wednesday, Friday 12:00 PM – 12:50 PM, Rm 1412

Section	TA		Day	Time	Room
0201		Lab	M	10:00AM-11:50AM	PHY 3306
		Discussion	M	9:00AM-9:50AM	PHY 3301
0202		Lab	M	2:00PM-3:50PM	PHY 3306
		Discussion	M	1:00PM-1:50PM	PHY 3301
0203		Lab	Tu	9:00AM-10:50AM	PHY 3306
		Discussion	Tu	8:00AM-8:50AM	PHY 3301
0204		Lab	Tu	3:00PM-4:50PM	PHY 3306
		Discussion	Tu	2:00PM-2:50PM	PHY 3301

Textbook: Knight, Jones, Field: *College Physics*, 2e

Math Background

The use of algebra and trigonometry are essential in this class. In addition, you need to recall the essentials of vector algebra and interpreting graphs. Your first assignment will be to help assess your competency with the math.

Homework

Weekly homework problems are listed below. These online exercises are accessed through MasteringPhysics. I have observed in the past that there is a strong correlation between the steady effort needed to successfully complete homework and performance on examinations. Although we will not collect and grade homework, there will be several quizzes using homework problems directly.

Solutions to all end-of-chapter problems homework assignments will be available on ELMS as well for additional practice.

Assessments

- There will be three examinations, each lasting a full period. Dates are in the schedule below. Each exam is worth 100-130 points
- You will have ten (more or less) 10-minute quizzes during your discussion period. They will be on material that was presented in lecture or from a homework problem. The weeks you will have a quiz are indicated on the schedule. Each quiz is worth 20 points
- A final exam will take place at the end of the course. The final will be worth 200 points
- Ten laboratory experiments are scheduled. All must be done. You must complete and submit a report for every experiment. Your TA will discuss the point value for labs
- You will receive up to 5 points for each completed MasteringPhysics homework assignment. The method for grading the MasteringPhysics items follows.
- Your grade will be based the total number of points you have accrued during the semester.

Grade recording:

Scores on all of your assignments will be recorded on ELMS soon after grading is complete. When different people are grading different parts of a homework assignment or an exam, it can take a little longer to collect all the parts and add them together. I will try to control the visibility of ELMS gradebook items so that when you see a score, it is an accurate sum of all the parts. Please check your scores periodically using the —My Grades menu link in ELMS and let me know as soon as possible if you think there is an error; I will do my best to investigate and correct mistakes.

How MasteringPhysics items will be graded:

MasteringPhysics automatically calculates decimal scores based on your answers (except for free response answers), but the rules for giving partial credit can be confusing. Here is how I will set up the grading:

- You get a maximum of six attempts to answer each part. For symbolic or numeric questions, each wrong answer before the correct one reduces your score on that part by 10%. For multiple-choice questions, each wrong answer before the correct one reduces your score by 25%.
- There is no penalty for opening a hint; you can get full credit even if you use all the hints. However, if you answer the part correctly *without* opening a hint, you get a token *bonus* of 2% per unopened hint. (You can even look at the list of hint topics without actually opening any of them.)
- If you open a hint that contains a question, and you answer that question incorrectly, then your score for that hint is reduced by 10%. On the other hand, if you answer a question in a hint correctly, then you *gain* some credit even if you are unable to answer the original question in that part correctly. There is no penalty for leaving a hint question unanswered.

You can always click on the —Grading Policy link at the top of an assignment to check the settings that apply to the assignment. If you think you have lost points unfairly for some technical reason, let me know what happened and I will look at the log of your answers and make an adjustment if appropriate. In addition to online items the MasteringPhysics grades automatically, there will be some items that ask you to type in explanations. Those will be read and graded by the TAs.

Course Policies

Late or missed work:

Assignments must be completed and turned in when they are due unless you have a valid excuse according to university policy, *e.g.* illness, in which case an extension will be granted. Please let me (not just your TA) know your situation as soon as possible, and I will tell you if I need documentation for the reason for your absence. No credit will be given for work turned in late without a valid excuse. In the case of illness, we will follow the university policy posted at
http://www.president.umd.edu/policies/v100g.html
The *first* time you miss a due date during the semester, I will accept a self-signed note from you (without a doctor's note) explaining the dates of your illness and stating that the information is true and correct. If illness causes you to miss more than one due date during the semester, or to miss an exam, I will require a doctor's note. If you do miss an exam, I will schedule a make-up time with you as soon as possible—it starts to cause problems if it's more than a few days later. In any case, whatever the reason for your absence, it is important that you contact me as soon as you reasonably can.

Policy on collaborating:

Working together with other students is part of the course; in fact, the tutorials and labs are specifically designed around teamwork. Working together to figure out the homework is also encouraged, but you must turn in **your own work**! This simple rule applies: **Never look at someone else's written solution.** Talking about how to work the problem is fine if it helps you to understand it better, but copying a solution is strictly forbidden.

Honor Code:

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. I will ask you to sign the Honor Pledge on exams; I won't ask you to sign it on each homework assignment, but it should be understood that the Honor Code still applies. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. Violations will be taken very seriously and may result in an XF grade for the course and possible suspension. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonorcouncil.umd.edu/SHC/Default.aspx .

Religious observances:

If you need to miss class, a homework deadline, or an exam due to a religious observance, please notify me in advance—preferably at the beginning of the semester.

Students with disabilities:

Accommodations will be provided to enable students with documented disabilities to participate fully in the course. Please discuss any needs with me at the beginning of the semester so that appropriate arrangements can be made.

Weather and emergency closures:

If the University is closed due to weather or some emergency situation on a day when homework is due, then that homework must be turned in at the beginning of the next class when the University is open. If the University is closed on the scheduled date of an exam, then the exam will be given during the next class period when the University is open. If the University is closed on any non-exam day, including just before an exam, then the exam will still be given according to the original schedule. If for some reason the University is closed for an extended period, I will continue the course by videotaping lectures and posting them on the web, and will ask you to watch them, read, and do tutorial and homework assignments on your own. In these or other exceptional circumstances, I will attempt to send out information by email.

Course announcements:

I will occasionally send important announcements to the class, specifically through Announcements in ELMS

Extra Help

Feel free to call my office phone anytime. The best way to communicate is via email.

Your TA will post his or her office hours

The Slawsky Clinic offers free tutoring for those who may need additional help improving their problem solving skills

Week	Date			Subject	Textbook	HW	Quiz	Lab
1	W	Sep	4	All About the Course				
						HW		
	F		6	Representing Motion	1.1-1.3	0		
2	M	Sep	9	Graphing Motion; Acceleration	2.1-2.4		1	Functions & Graphs
	W		11	Constant Acceleration	2.5-2.7			
						HW		
	F		13	Numbers, Units & Uncertainty	1.4	1		
3	M	Sep	16	Force & Mass; Newton's Laws	4.1-4.2		2	The Pendulum
	W		18	Springs, Strings & Atoms	4.3-4.4,8.3			
						HW		
	F		20	Solving Problems w/ Newton	4.5-4.6	2		
4	M	Sep	23	Newton's Third Law	4.8, 5.7		3	Motion w/ Constant Acceleration
	W		25	Apparent Weight	5.3			
						HW		
	F		27	Drag	5.6	3		
5	M	Sep	30	Vectors; Relative Motion	3.1-3.3,3.5		4	Conservation of Energy
	W	Oct	2	Sideways Acceleration	3.6-3.8			
						HW		
	F		4	Review & Discussion		4		
6	M	Oct	7	**EXAM I**				Equilibrium of Forces
	W		9	Newton's Laws in 2-D	4.4-4.7			
						HW		
	F		11	Applying Newton's Laws in 2-D	5.2,5.4,5.8	5		
7	M	Oct	14	Friction	5.5		5	
	W		16	Circular Motion & Forces	6.3-6.4			
						HW		
	F		18	Gravity & Orbits	6.5-6.7	6		
8	M	Oct	21	Impulse & Momentum	9.1-9.3		6	Conservation ofLinear Momentum
	W		23	Momentum Conservation	9.4-9.6			
					10.1-	HW		
	F		25	Work, Energy & Power	10.2,10.8	7		
9	M	Oct	28	Kinetic & Potential Energy	10.3-10.4		7	Centripetal Force & Acceleration
	W		30	Energy Conservation	10.6-10.7			
						HW		
	F	Nov	1	Review & Discussion		8		
10	M	Nov	4	**EXAM II**				Equilibrium of Rigid Bodies
	W		6	Rotational Motion & Torque	7.1-7.3			
	F		8	Rotational Dynamics	7.4-7.5,9.7	HW		

						9		
12	M	Nov	11	Equilibrium & Balance	8.1-8.2		8	Mechanical Equivalent of Heat
	W		13	Elasticity & Material Strength	8.4			
						HW		
	F		15	Fluid Density & Pressure	13.1-13.3	10		
13	M	Nov	18	Buoyancy; Fluid Dynamics	13.4-13.5		9	
	W		20	Viscosity & Fluid Flow	13.6-13.7			
						HW		
	F		22	Thermal Energy & Temperature	11.4	11		
14	M	Nov	25	Gass Pressure & Ideal Gas Law	12.1-12.2		10	Simple Harmonic Motion & Hooke's Law
	W		27	Gas Processes & Thermal Expansion	12.3-12.4			
	F		29	**Thanksgiving Break**				
15	M	Dec	2	Review & Discussion				
	W		4	**EXAM III**				
						HW		
	F		6	Energy Usage in Living Systems	11.1-11.3	12		
16	M	Dec	9	Heat Flow & Diffusion	11.5,12.8			
	W		11	Using Thermal Energy; Entropy	11.6-11.9			
						HW		
	F		13	Course Discussion & Review		13		
		Dec	16-21	**FINAL EXAM**				