PHYS161 General Physics: Mechanics & Particle Dynamics – Fall 2013
Sections 0101-0104 – 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*. PHYS161 is the first semester of a three-semester calculus-based general physics course. Laws of motion, force, and energy; principles of mechanics, collisions, linear momentum, rotation, gravitation, simple harmonic motion, and fluids will be studied.

Lecture: Monday, Wednesday, Friday 3:00 PM – 3:50 PM, Room 1410
Students are required to attend lectures, where the course material will be presented, and exams will be announced and administered.
Not all material will be directly covered in lectures. Students are responsible for reading and understanding all material in assigned chapters, whether or not this material is explicitly treated in the lectures.

Discussion Sections
Discussion sections will be conducted by the Teaching Assistant, and are a forum where students can ask questions about the course material and where problems will be worked out with student participation. They are also where you will have your quizzes based on homework problems.

Section	TA	Day	Time	Room
0101		Tu	3:00PM–3:50PM	PHY 1402
0103		F	10:00AM–10:50AM	CHM 0128
0104		F	11:00AM–11:50AM	PHY 0405

Textbook: Knight: **Physics for Scientists and Engineers** Volume 1, **Third edition**, (Addison Wesley)
Although your homework will be assigned on line through Mastering Physics from the third edition of Randall Knight, please note that insofar as the course material is concerned there is very little of any difference between the 2nd edition and the 3rd edition in regard to Vol. 1. There are significant differences in other volumes but not that of Vol. 1. Therefore, if you were to purchase a used 2nd edition of volume 1 you would not be missing out on anything important – the only difference would be that

the assigned HW numbers from the 3rd edition on the Mastering Physics probably would not coincide with the HW problems from the second edition.

Math Background

Since this is a calculus-based course**,** MATH140 is a prerequisite for this course. MATH141 is the co-requisite

You will need a working calculator for the class and particularly for the exams. You will be allowed a "cheat sheet" of physical constants and formulas during exams

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 two 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
- 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 as follows:

Exams (2 x 20%):	40%
Final Exam	40%
Homeworks & Quizzes	20%

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.
The final grade will be set at the end of the semester after all work is completed. In assigning the final grade, I will be guided by the University of Maryland grading policy, quoted below:

- A+, A, A- denotes excellent mastery of the subject and outstanding scholarship. (90-100)
- B+, B, B- denotes good mastery of the subject and good scholarship. (80-90)
- C+, C, C- denotes acceptable mastery of the subject and the usual achievement expected. (70-79)
- D+, D, D- denotes borderline understanding of the subject. It denotes marginal performance, and it does not represent satisfactory progress toward a degree. (60-70)
- F denotes failure to understand the subject and unsatisfactory performance. (< 60)

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	Ch Sections	HW	Quiz
1	W	Sep	4	Introduction & Terms			
	F		6	Vectors & Math	3		
2	M	Sep	9	Motion (p-v-a)	1		
	W		11	Graphing 1-D Motion	2.1-2.3	1	
	F		13	Constant Acceleration in 1-D	2		
3	M	Sep	16	2-D Motion; Projectiles	4.1-4.3		1
	W		18	Circular Motion & Relative Motion	4.4-4.7	2	
	F		20	Non-Uniform Circular Motion	4		
4	M	Sep	23	Forces ; Laws of Motion	5.1-5.6		2
	W		25	Free-Body Diagrams	5.4-5.7,7.1-7.3	3	
	F		27	1-D Dynamics	6.1-6.3		
5	M	Sep	30	Friction & Drag	6.4-6.5		3
	W	Oct	2	Statics & Pulleys	7.4-7.5	4	
	F		4	Uniform Circular Motion	8.1-8.3		
6	M	Oct	7	2-D Dynamics	8.4-8.7		4
	W		9	Kinetic Energy; Gravitational PE	10.1-10.3	5	
	F		11	Energy Conservation; Elastic PE	10.4-10.5		
7	M	Oct	14	**EXAM I**	CH 1-8, 10		
	W		16	Energy & Environment		6	
	F		18	Work & Energy	11.1-11.5		
8	M	Oct	21	Power & World Energy Problem	11.6-11.8		5
	W		23	Impulse & Momentum	9.1-9.3	7	
	F		25	Inelastic Collisions & Explosions	9.4-9.5		
9	M	Oct	28	2-D Collisions; Elastic Collisions	9.6, 10.6		6
	W		30	Collision Problem-Solving	9.2,9.4-9.6,10.6	8	
	F	Nov	1	Rotational Kinematics	12.1-12.2		
10	M	Nov	4	Torque & Moment of Inertia	12.3-12.5		7
	W		6	Rotational Dynamics	12.5-12.7	9	
	F		8	Equilibrium & Angular Momentum	12.8-12.11		
12	M	Nov	11	Newtonian Gravity; Gravitational Field	13.1-13.4		8

	W		13	Kepler's Laws; Gravitational PE	13.5-13.6	10	
	F		15	Gravitation Problem-Solving	13		
13	M	Nov	18	Review	CH 9, 11-13		9
	W		20	Implications of Newtonian Mechanics		11	
	F		22	**EXAM II**	CH 9-13		
14	M	Nov	25	Simple Harmonic Motion	14.1-14.3		
	W		27	SHM Dynamics; Vertical Oscillators	14.4-14.5	12	
	F		29	**Thanksgiving Break**			
15	M	Dec	2	Pendulum; Damping	14.6		
	W		4	Fluid Density & Pressure	15.1-15.2	13	
	F		6	Fluid Dynamics	15		
16	M	Dec	9	Pascal's Principle; Hydraulic Lift	15.3		10
	W		11	Archimedes' Principle	15.4	14	
	F		13	Course Review			
		Dec	16-21	**FINAL EXAM**			