Fall Semester 2014

PHYS 161 Course: General Physics

Mechanics and Particle Dynamics

Instructor:

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Office Hours: Mon-Fri; 14:00 – 16:00

TA's:

Sections 0301 and 0302 - Daniel Campbell (djcampbe@umd.edu)
Sections 0303 and 0304 -Julie Schnurr (jschnurr@umd.edu)

Lecture:

Toll Physics Building Rm. 1410; MWF 10:00-10:50

Discussion Sessions:

Section 0301 Thu 15:00-15:50, Rm. PHYS 1204
Section 0302 Tue 16:00-16:50, Rm PHYS 1219
Section 0303 Wed 12:00-12:50, Rm PHYS 0405
Section 0304 Wed 15:00-15:50, Rm MTH 0106

Course Description: Physics is an observational science and is a way of thinking, learning and understanding the physical aspects of nature. A study of physics focusses on discovering relationships between observational facts and patterns that exist in nature and emphasizes thinking and learning. It searches for reasons why things happen in nature as they do, using mathematics for quantitative understanding. PHYS 161 course is the first semester of a three-semester calculus-based general physics course covering classical mechanics including laws of motion, force, acceleration, momentum, work, energy, principles of mechanics, collisions, rotation, gravitation, simple harmonic motion and fluid dynamics.

Textbook: Required textbook is **"Physics for Scientists and Engineers", Volume 1, 3rd Edition by Randall D. Knight (Pearson Education Inc.)**. ISBN 978-0-321-74090-8

Homework: Homework will be assigned online through 'Mastering Physics' (www.masteringphysics.com) from the 3rd edition of the text book. As far as the course material is concerned, there is very little difference between the 2nd and the 3rd editions of Volume 1. However, some of the assigned homework problem numbers from the 3rd edition on the Mastering Physics may be different from the 2nd edition. It is student's responsibility to make sure that you are answering the correct question.

Students are required to submit their solutions to the homework problems through the 'Mastering Physics' website over the internet. In order to turn in your homework, you will need to register at the Mastering Physics website. To register, you need two things – a personal access number and the class ID. When you buy a new or used copy of your text book, you will need to purchase a Mastering Physics access key number. The easy way to do this is to simply buy it online from the MP website. The class ID for your class is 'MPTONWAR50925'.

The ‘Mastering Physics’ website is best accessed with a current version of Windows Explorer or Firefox. In the past, there have been major issues working on ‘Mastering Physics’ problems through Google Chrome.

The electronic homework submission through ‘Mastering Physics’ offers a number of advantages:

(a) You will know right away if your answer is right or wrong.

(b) If you gave a wrong answer, you can go back and redo the problem and try to get the correct answer. You are graded only on your final answer and you get your score immediately when you are done.

(c) You will be allowed 6 attempts for each question. 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%. Therefore, you are advised not to waste accesses trivially and try to understand the reason for the wrong answer before attempting to solve the problem again.

(c) 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).

(d) 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 heaving a hint question unanswered.

(d) The site offers tutorial capabilities which may be useful.

Note that the site may randomize the numerical values for the problem each time you make a new attempt on a problem. So be careful and remember that other students working on exactly the same problem are likely to have different numerical values. The best way to do physics problems is first to work out carefully a general analytical solution to the problem and then plug in the numbers at the end. This is especially true

if the numbers are being randomized each time so everyone has different numbers .

Also note that the homework can be expected to be difficult but it counts a lot towards your final grade. One of the best ways for developing a good understanding of physics is by doing the homework problems. It is not a good idea to start working on your homework during the night just before it is due. A sure way to get an F in this course is to not do the homework or not give yourself enough time to work on it.

Policy on Collaborating: Working together with other students is part of the course, for example, in the lectures and discussions. Working together to study and figure out the homework is also encouraged but you must do and turn in your own work. The simple rule is – never look at someone else's written solution (on paper, a blackboard or a screen). That applies to your classmates as well as anything you find on the web. Talking about how to work the problem is fine if it helps you to understand it better but copying a solution is strictly forbidden (it will not enable you to succeed in the exams). Work that appears to have been copied will receive zero credit and may lead to an academic integrity referral.

Laboratory: There is no lab component of PHYS 161.

Exams: There will be two mid-term exams and a 2-hour Final exam. You must take the Final exam in order to pass the course. All exams are closed-book and closed-note exams. For each exam you will be allowed one "cheat-sheet" that contains physical constants and formulae. You are also allowed the use of a scientific calculator during the exams.

Excuses: Submission of homework late or missing an exam is not allowed without valid documented excuse as defined by the University http://www.president.umd.edu/policies/v100g.html (medical problem, religious holiday or serious family crisis). In every case, a make-up

assignment or a make-up exam must be completed in a reasonable amount of time to avoid a score of zero for the assignment or the exam. The make-up assignment or the exam and its due date must be arranged by consulting with the instructor as soon as possible after it becomes apparent that an assignment or exam due date will be missed. If you are going to miss an assignment because of a religious holiday, it is your responsibility to inform the instructor sufficiently in advance so that suitable alternate arrangement can be made.

Religious Observances: If you need to miss class, discussion, a homework deadline, or an exam due to a religious observance, please notify the instructor, preferably at the beginning of the semester, so that appropriate arrangements can be made.

Final Grade: The final grade for the course at the end of the semester will be based on the following three components with their respective weights:

Two mid-term exams (2 x 20%)	= 40%
Comprehensive Final exam	= 40%
Homework and Quizzes	= 20%

The final course grade will be computed at the end of the semester after all the work is completed. The final grade will be assigned guided by the University of Maryland grading policy:

- A+, A, A- denotes excellent mastery of the subject and outstanding scholarship (85-100).
- B+, B, B- denotes good mastery of the subject and good scholarship (70-85).
- C+, C, C- denotes acceptable mastery of the subject and the usual achievement expected (50-70).
- D denotes borderline understanding of the subject. It denotes marginal performance and it does not represent satisfactory progress towards a degree (40-50).

- F denotes failure to understand the subject and unsatisfactory performance (< 40).

Students with disabilities: Students with disabilities should meet with the instructor at the beginning of the semester so that appropriate arrangements can be made to accommodate their needs.

University Closure: Winters in the Washington Metro area can bring large snowstorms that make travel dangerous. In the event of a University closure due to inclement weather or some emergency situation, classes will be cancelled and the lecture material will be rescheduled for the following working day or by scheduling make-up sessions. University closings are announced over local radio and TV as well as on the University homepage (www.umd.edu).

Academic Integrity: "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. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation and plagiarism". For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonorcouncil.umd.edu/whatis.html.

Fall 2014
PHYS 161 (Sections 0301 – 0304) Course Schedule

Wk #	Mon	Date	Day	Subject	Chap. Sect.	HW	Quiz
1	Sep	03	Wed	Introd., Terms, Units	1		
		05	Fri	Uniform Motion in 1-D	2		
2	Sep	08	Mon	Const. Acceleration in 1-D	2	1	
		10	Wed	Vector Algebra	3		
		12	Fri	Vector Algebra	3		
3		15	Mon	Motion in 2-D	4	2	
		17	Wed	Uniform Circular Motion	4		
		19	Fri	Non-uniform Circ. Motion	4		
4		22	Mon	Forces – Laws of Motion	5	3	
		24	Wed	Free-body Diagrams	5		
		26	Fri	Friction and Drag	6		
5		29	Mon	Newton's 3rd law	7	4-6	
	Oct	01	Wed	Motion in a Plane	8		
		03	Fri	Circular Orbits	8		
6		06	Mon	Review	1-6		
		08	Wed	Exam I	1-6		
		10	Fri	Momentum and Impulse	9		
7		13	Mon	Inelastic Collisions	9	7	
		15	Wed	Kinetic Energy	10		
		17	Fri	Grav. Potential Energy	10		
8		20	Mon	Restoring Forces	10	8-9	
		22	Wed	Work and Energy	11		
		24	Fri	Energy Cons & Power	11		
9		27	Mon	Rotational Motion	12	10-11	
		29	Wed	Torque	12		
		31	Fri	Rotational Dynamics	12		
10	Nov	03	Mon	Static Equilibrium	12	12	
		05	Wed	Rolling Motion	12		
		07	Fri	Angular Momentum	12		

11		10	Mon	Review	7-12		
		12	Wed	Exam II	7-12	13	
		14	Fri	Newton's Gravity	13		
12		17	Mon	Kepler's Laws	13		
		19	Wed	Simple Harmonic Motion	14	14	
		21	Fri	Vertical Oscillations	14		
13		24	Mon	Damped Oscillations	14		
		26	Wed	Problems	14		
		28	Fri	Thanksgiving Holiday			
14	Dec	01	Mon	Fluids	15	15	
		03	Wed	Buoyancy	15		
		05	Fri	Fluid Dynamics	15		
		08	Mon	Problems	15		
		10	Wed	Problems	15		
		12	Fri	Review	1-15		
		16	**Tue**	**FINAL EXAM**	**1-15**		

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Final Exam: Tue, Dec 16, 2014, 06:30-08:30 pm, PHYS 1412

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