GENERAL PHYSICS I

Physics 880:054, Section 1
Spring 2009

INSTRUCTOR: Dr. Michael W. Roth

OFFICE: Physics (BEG) 313

OFFICE HOURS: 11 A.M. – 12 P.M. MWF; 3 P.M. – 4 P.M. W

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URL / Class Web Page: http://faculty.cns.uni.edu/~rothm/roth.htm ; then click on "Roth's Spring 2009 Courses"

MEETING SPACETIME INFORMATION: M, W 8 – 9:50 A.M.; F 9 – 9:50 A.M. in PHY 114 / PHY 314.

COURSE DESCRIPTION: *General Physics I* is an activity-based approach to learning various components of classical mechanics (motion, force, energy, momentum, power, angular momentum, etc.). Emphasis will be placed on learning in an interactive setting including completion of various activities in tandem with discussion, introduction to theory and copious amounts of problem solving.

OBJECTIVES: The ideal mission of *General Physics I* is to spark interest in science and passion for learning in the eyes of students, to have students critically think and analyze the world around them and for the class to be an experience far deeper than just a series of meetings and deadlines. At a more pragmatic level, *General Physics I* will help the student prepare for a career in any field(s) where science is important. The successful student will be able to envision how physics applies to situations in the everyday world as well as in technical settings and will be able to problem solve at a level utilizing algebra.

REQUIRED READING MATERIALS:

Textbook: *College Physics: A Strategic Approach* Vol. 1, by R. Knight, B. Jones, and S. Field, Pearson-Addison Wesley (2007).

PREREQUISITE(S): High school algebra and trigonometry or equivalent.

SPECIAL NEEDS: The Americans with Disabilities Act of 1999 (ADA) provides protection from illegal discrimination for qualified individuals with disabilities. If you have any condition such as a physical or learning disability, which will prevent the fullest expression of your abilities or will require academic accommodations and would like to request instructional accommodation due to disabilities, you must arrange for such accommodation through the Office of Disability Services, 213 Student Services Center, Tel. 273-2676.

EXTRA CREDIT/DROPPED GRADES: I don't offer extra credit that will add numerically to your score, nor do I drop any test scores, because I don't want to discount the importance of the regular material being presented in the course. However I drop the lowest lab activity score and the lowest

homework score. In addition, the problems on fluids & sound will not be covered in regular class but the homework problems for those two sections together can count as a homework or activity grade, widening the options for the best scores that factor into calculation of your grades.

GRADING: I have tried to make every major effort for you in this class worth a "test score", or 100 points. Your grade will be calculated based on the best 6 out of 7 homework sets, 3 in class tests, the best 9 out of 10 activity reports and one comprehensive, in-class final examination with the following weights:

6 best homework sets of equal weight (100 pts. total possible)
3 in class tests of equal weight (300 pts. total possible)
9 best activity reports of equal weight (100 pts. total possible)
1 comprehensive final test (100 pts. possible)

Although any appropriate curve(s) will be announced in class, *it is assumed that the following standard scale will be utilized*. The grade cutoffs are as follows:

93% and above A,	77% C+,	60% D-,
90% A-,	73% C,	below 60% F
87% B+,	70% C-,	
83% B,	67% D+,	
80% B-,	63% D,	

ATTENDANCE: Although roll is not formally taken in class, it is expected that all participants with body temperatures above 80F will attend regularly. (If you are not in this category please see me.) If there is a reason that you must miss class please talk with me to make arrangements to cover the material.

LATE POLICY: Homework sets and lab/activity reports are due on the dates indicated on the class calendar. Your work is due on time, with the exception of reasonable **documented** excuses. *Late work will be docked 50% of face value and 100% after solutions have been posted.* **Homework solutions will be posted two class days after the due date.** If you are going to miss a test, you **must** notify me in advance (preferably one week) so alternative arrangements can be made. If you miss a test, which is not excused, a grade of zero points must be assessed for that particular piece of work. You must take all three-hour exams as well as the final exam in order to pass the course.

ACADEMIC DISHONESTY/PLAGIARISM: Collaboration on homework and certainly activities is welcome, but please keep in mind that your final, turned-in work should be your own and not copied. No form of cheating/plagiarism will be tolerated in this class. If anyone is suspected of academic dishonesty, I will privately speak with them in an attempt to reach a solution to whatever problem is manifesting itself. If anyone is without doubt determined to be cheating on a given assignment/test and no resolution can be offered, *negative credit will be given*. In extreme cases, the Department and/or College administration will become involved.

GENERAL PHILOSOPHY: In a nutshell, I believe in having fun while teaching and learning physics. I want you to do your best in a subject that is not easy. If you get behind and the class feels like a diesel tractor pulling you through mud, feel free to use me as a resource to help you, as well as the **physics tutors** who are available at times I will announce. Asking questions in class is strongly encouraged. If you don't wish to ask questions in class please come by my office, give me a call, make an appointment or even send me anonymous e-mail! Also, I like to talk a little about related contemporary issues in class,

so if you've found an interesting newspaper clipping or watched a good documentary you'd like to share with us, please mention that. The most entertaining to me are tabloid articles that beg to be de-bunked using physics. I hope you find that physics is everywhere around you and not just in a class you had to take.

INSTRUCTOR'S STATEMENT: The instructor reserves the right to modify this syllabus in a reasonable fashion and in the best interest of the class.

ACTIVITY REPORTS: Your activity report should contain a title, purpose statement and answers to the activity questions. Please make sure that **all graphs are on graph paper** (I will provide this for you), that **you show sample calculations** somewhere in the report if appropriate and last but not least that any **figures you draw are constructed as carefully and neatly as possible**. Please remember that you have some time to turn in your reports. This is mainly because I want to see your best work and I don't want you to feel you have to rush to get any activity report done without thorough consideration. **The best answers are complete, well-constructed sentences**. Feel free to take time and elaborate on your ideas! I thoroughly enjoy my job and will gladly take the time to read what you have to say. In fact, the criterion I use for complete answers to questions is the following: *your answer is complete when someone not having seen the lab activity guide is able to reconstruct the question you were responding to just from your answer.* Activity reports are graded on a scale of 10 points max, but typical scores fall in the 8-9 range. An 8 means that I thought you did a good job on the activity. A 9 means you exhibited a particularly clear understanding of the material, possibly made very nice figures, etc. – a *very* nice job! A 10 means you showed unexpected insight and initiative – that you went above and beyond the call of duty in either the activity or the content of the write – up. If you score less than 8 on either of your first two activity write–ups you may see me and re-submit your work for re-consideration. After all, the activities are a learning tool, not a testing tool.

Table of Activities

About Homework

Homework sets need not be typed but should be neat and readable. Answers to conceptual questions should include all reasoning. Answers to quantitative problems should show all steps taken to get the answer. Since you will be provided with numerical answers to all assigned problems, answers to homework problems that are only a number or answer with no supporting reasoning **will not be given credit**. Homework due dates are indicated in the schedule; please see the "Late Policy" section for details. The homework problems I have selected for you are in the following table. Problems beginning with "C" are conceptual questions and all others are "Problem" questions.

HW Set	Chapter	Assignment
1	**1**	**Q25; P 14, 19, 27, 35, 51, 56, 59, 60**
2	**2**	**Q13, 14; P 21, 22, 26, 30, 32, 53, 56, 60**
2	**3**	**Q21; P 15, 16, 31, 33, 38, 43, 47, 60, 72**
3	**4**	**Q19, 24, 27; P1, 4, 18, 25, 50, 56, 62**
4	**5**	**Q30; P4, 17, 20, 24*, 27, 29, 36, 38, 56, 57** *** - add:** **(c) Calculate the acceleration down the ramp** **(d) Calculate the time required to travel 4 m down the ramp starting from rest.**
4	**6**	**P15, 19, 23, 24, 33, 56**
5	**7**	**P5, 11, 19, 26, 32, 33, 42, 58, 62, 65**
6	**10**	**P4, 8, 9, 12, 17, 18, 41, 51, 53, 55, 61(a,b only), 62, 66**
6	**9**	**P10, 13, 14, 21, 26, 32, 35, 59, 72, 74**
7	**8**	**Q9; P8, 18, 21, 24, 37, 39, 43, 48, 50**
7	**14**	**Q10, 11; P6, 8, 15, 16, 20, 24, 25, 27, 42, 43**
Fluids **(*Sound*)**	**13** ***15***	**Q15, 32; P1, 6, 19, 25, 32, 34, 45, 59** ***P1, 15, 17, 21, 24, 25, 31, 36, 37, 55***

GENERAL PHYSICS I CLASS SCHEDULE – SPRING 2009

Week	Day	Date	Topic(s)	*Activities*	Text Chapter	Item(s) Due
1	M	Jan. 12	Introduction/Math Concepts		1	
	W	14	Motion in One Dimension	*Activity 1*	1/2	
	F	16	Problem Solving		1/2	
2	M	Jan. 19	**No Class – Martin Luther King, Jr. Day**			
	W	21	Motion in One Dimension (includes guest presenter)	*Activity 2*	2	Act 1
	F	23	Problem Solving		2	
3	M	Jan. 26	Vectors		3	
	W	28	Vectors	*Activity 3*	3	Act 2
	F	30	Problem Solving		3	HW 1
4	M	Feb. 2	Motion in Two Dimensions		3	
	W	4	Motion in Two Dimensions	*Activity 4*	3	Act 3
	F	6	Problem Solving		3	
5	M	Feb. 9	Catch-up & review		1-3	HW 2
	W	11	**Exam #1 (Ch. 1-3)**		**1-3**	Act 4
	F	13	About Exam 1			
6	M	Feb. 16	Forces/Newton's Laws		4	
	W	18	Forces/Newton's Laws	*Activity 5*	4	
	F	20	Problem Solving		4	

Week	Day	Date	Topic(s)	*Activities*	Text Chapter	Item(s) Due
7	M	Feb. 23	Forces/Newton's Laws		4	
	W	25	Applications of Newton's Laws	*Activity 6*	4/5	Act 5
	F	27	Problem Solving		4/5	HW 3
8	M	Mar. 2	Applications of Newton's Laws		5	
	W	4	Applications of Newton's Laws/Gravity	*Activity 7*	5/6	Act 6
	F	6	Problem Solving		5/6	
9	M	Mar. 9	Catch-up / Review		4-6	HW 4
	W	11	**Exam #2 (Ch. 4-6)**		**4-6**	Act 7
	F	13	About Exam 2			
10	M	Mar. 16	**No Class – Spring Break**			
	W	18	**No Class – Spring Break**			
	F	20	**No Class – Spring Break**			
11	M	Mar. 23	Rotational Motion		7	
	W	25	Rotational Motion		7	
	F	27	Problem Solving		7	
12	M	Mar. 30	Work and Energy		10	
	W	Apr. 1	Work and Energy	*Activity 8*	10	
	F	3	Problem Solving		10	HW 5
13	M	Apr. 6	Momentum and Collisions		9	
	W	8	Momentum and Collisions	*Activity 9*	9	Act 8
	F	10	Problem Solving		9	

Week	Day		Date	Topic(s)	*Activities*	Text Chapter	Item(s) Due
14	M	Apr.	13	Catch Up / Review		7; 10; 9	HW 6
	W		15	**Exam #3 (7; 10; 9)**		**7; 10; 9**	Act 9
	F		17	About Exam 3			
15	M	Apr.	20	Equilibrium and Elasticity		8	
	W		22	Equilibrium and Elasticity		8	
	F		24	Problem Solving		8	
16	M	Apr.	27	Oscillations		14	
	W		29	Oscillations	*Activity 10*	14	Act 10
	F	May	1	Review		All	HW 7
17		**May**	**4**	**FINAL EXAMINATION (½new; ½ old), 8:00 – 9:50 A.M.**			