

Physics in Everyday Life / Conceptual Physics Lecture

Physics 880:012:01 / 880:011:01 lecture

Fall 2007

INSTRUCTOR: Dr. Michael W. Roth

OFFICE: Physics 313

OFFICE HOURS: T, Th 11 AM – 12 PM; W 3 – 4 PM and by appointment

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URL: <http://faculty.cns.uni.edu/%7Erothm/roth.htm> (Follow the link under the “Roth’s Fall 2007 Courses” section for our course web page.)

MEETING SPACETIME INFORMATION: T,Th 12:30 – 1:45 P.M. in PHY 114

COURSE DESCRIPTION: Physics in Everyday Life is a descriptive course primarily for non-science majors that deals with the applications of physics to commonly experienced phenomena and machines.

OBJECTIVES: The mission of Physics in Everyday Life is to spark interest in the eyes of students, to have students question and analyze the world around them, to have students think, and for the class to be an experience far deeper than just a series of meetings and deadlines. At a more pragmatic level, the course will prepare the student to apply physics and physical science concepts in their career and personal worlds.

REQUIRED READING MATERIALS: How Things Work- The Physics of Everyday Life 3rd edition by Louis A. Bloomfield (John Wiley & Sons, 2006)

PREREQUISITE(S): Student must have satisfied University entrance requirements in English and Mathematics.

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, the main reason being that I don’t want to discount the

importance of the regular material being presented in the course. However I do drop the lowest homework score.

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 7 out of 8 homework sets, 3 in class tests and one comprehensive, in-class final examination with the following weights:

- 7 best homework sets of equal weight (100 pts. total possible)
- 3 in class tests of equal weight (300 pts. total possible)
- 1 comprehensive final test (100 pts. possible)
- 1 Lab Component (Conceptual Physics only; 100 pts. total 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 / ABSENCE: Although roll is not formally taken in class, I strongly recommend regular attendance. The course has a significant component of interactive learning, and the activities done in class reinforce the material discussed. If there is a reason that you must miss class please talk with me to make arrangements to cover the material. I post lecture notes on the web site in advance of class. The lecture notes have gaps which I fill in during class. If you miss class, I won't give out the filled in version of the notes. However I enjoy student contact and want to maximize your learning experience, so please download the notes and make an appointment with me to go through the notes and help you fill them in. It can also good to get the notes from another student so you will have any incidentals, such as spontaneous discussion, questions, bad jokes, etc.

LATE POLICY: Homework sets 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.* If you are going to miss a test, you **must** notify me in advance (preferably one week) so alternate arrangements can be made. If you miss a test and your absence 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 is welcome, but please keep in mind that your final, turned-in work should be your own and not copied. However, 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 may not be that easy for you. 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.

PHYSICS IN EVERYDAY LIFE CLASS SCHEDULE – FALL 2007

Week	Day	Date	Topic(s)	Text Section	Item(s) Due
1	T	Aug. 21	Introduction	1.1	
	Th	23	Falling Bodies	1.2	
2	T	28	Ramps	1.3	
	Th	30	Seesaws	2.1	
3	T	Sept. 4	Wheels	2.2	
	Th	6	Bumper Cars	2.3	HW1 (CH 1)
4	T	11	Review		HW2 (CH 2)
	Th	13	Exam 1 (1.1 - 2.3)		
5	T	18	Carousels and Roller Coasters	3.5	
	Th	20	Balloons	5.1	
6	T	25	Balls and Air; Airplanes	6.2/6.3	
	Th	27	Tornadoes and Hurricanes		
7	T	Oct. 2	Woodstoves	7.1	
	Th	4	Water, Steam and Ice	7.2	HW3 (CH 3 - 5)
8	T	9	Review		HW4 (CH 6 – 7.2)
	Th	11	Exam 2 (3.5 – 7.2)		
9	T	16	Incandescent Light Bulbs	7.3	
	Th	18	Static Electricity/ Copiers	10.1/10.2	
10	T	23	Flashlights	10.3	
	Th	25	Electric Power Distribution	11.2	

11	T Th	30 Nov. 1	Radio Microwave Ovens	13.1 13.2	HW5 (CH 7.3 – 10)
12	T Th	6 8	Review Exam 3 (7.3 – 11.2)		HW6 (CH 11)
13	T Th	13 15	Sunlight Discharge Lamps	14.1 14.2	
14	T Th	20 22	No Class – Thanksgiving Break No Class – Thanksgiving Break		
15	T Th	27 29	Lasers and LED's Cameras	14.3 15.1	HW7 (CH 13,14)
16	T Th	Dec. 4 6	Medical Imaging and Radiation Review	16.2	HW8 (CH 15,16)
	Th	Dec 13	FINAL EXAMINATION (COMPREHENSIVE), 3:00 – 4:50 P.M.		

ABOUT THE HOMEWORK: Homework sets need not be typed but should be neat and readable. Answers to conceptual (“Exercises”) questions should include all reasoning. Answers to problems requiring simple calculations (usually “Problems”) should show all steps taken to get the answer. Homework problems showing 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.

PHYSICS IN EVERYDAY LIFE HOMEWORK LIST – FALL 2007

HW Set	Chapter	Exercises	Problems
1	1	8,9,12,13,15,24,31,35,39	1,3,4,16,17,18
2	2	2,4,8,10,15,17,20,32,40	1,9,10
3	3	26,30,31,35,37	5,6
3	5	2,4,6,7,12,14,16	2,7,8
4	6	8,14,20,26,30,34,36,41	
4	7 (up to 7.2)	5,7,9,10,21,28	
5	7 (7.3 onwards)	31,35,37	
5	10	5,12,14,34,37,39,42	3,5,21,28
6	11	17,19,21,23,29,32	
7	13	13,16,17,18,20,23,25,26	7,8,9
7	14	3,5,9,12,13,25,27,28,34,39	1,3,4
8	15	4,7,10,12,13,15,26	
8	16	20,21,24,25,26,27	