Phys 122-MWF   S.M. BHAGAT
Fall 2009   Bldg 082, Rm 2331 (Off.)
                                                            Rm 2221 (Lab)
                                                    Tel: 301-405-6144 (VM)
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Title: Fundamentals of Physics II

Lecture MWF 1:00 PM, Phys 1410

0101 M 3   Phys 1219
0102 Tu 9   Phys 4208
0103 Tu 11   Phys 0405
0104 Tu 1   Phys 4208

Textbook: College Physics
                Knight- Jones- Field

Introduction

Welcome to Phys 122. Most of you have recently "endured" the first semester of a course on trying to understand the fundamental properties of the observable part of our universe by using the methods of Physics. As always, the attempt is to develop the simplest and most economical description. Consequently, the results are SIMPLE but not necessarily easy to comprehend.

By and large, Phys 121 dealt with natural phenomena pertaining to motion of particles and rigid bodies supplemented by a brief discussion of Thermodynamics. The ensuing set of studies will start by discussing mechanical oscillations and then focus on waves: "A Sound and Light Show." We interact with our surroundings using our ears and eyes. Surely, you would agree that it would be fruitful to understand the agencies which mediate these interactions.

Hopefully, at the end of this two semester experience we will develop a good feel for the two essential ingredients of our observable universe – Matter and Radiation.

Math Background

As in Phys 121 we will not use calculus. However, algebra and trigonometry are used throughout. Also, do review the essentials of vector algebra. If you need help, please get it as soon as possible. As described below, I am always available. Never hesitate to let me know if you are experiencing difficulties.

Textbook/Additional Material (~150 pages)

The Textbook has too much material. However, in spite of exploring several alternatives, I have yet to find a book which focuses only on our requirement. Consequently, we will stray from the book fairly often. I shall make it a point to place notes online to supplement the text. Nearly 150 pages will be made available. Also, if you miss a class, I invite you to borrow my class notes. IT IS CRUCIAL TO REMEMBER THAT THE EXAMS ARE BASED ON LECTURE CONTENT SO IF YOU DO NOT STUDY THE ADDITIONAL MATERIAL YOU WILL BE AT A SERIOUS DISADVANTAGE. [I am also giving you a copy of the notes from Phys121]

Test Questions/ Review

About two weeks prior to every exam, a set of test questions will be posted online. The idea is that you should have enough time to formulate your answers and I will discuss the same in a review session which is typically scheduled for the evening of Tuesday prior to the "hourly". The review for the final exam will be scheduled later.

Homework

Weekly homework problems are listed on the attached schedule. Please note that there are problems from the book as well as supplementary problems (online). Do them all. Although we will not collect and grade your homework, there will be several quizzes using homework problems directly. Also, the hourly examinations will have somewhat similar problems. The bottom line is: if you cannot do the homework, you cannot expect a good grade.

Solutions

Solutions will be posted each week in glass cases outside the lecture halls as well as online at… And, if permitted, in the Engineering Library in the Math Bldg.

Tests

a)   There will be three (3) examinations, each <u>lasting a full period</u>. Dates are in the attached schedule.

b)   Ten (10) 10-minute quizzes during class (Q on schedule)

c)   Avoid make-ups/No make-ups will be given for Quizzes.

d)   The final exam is scheduled for Tues., Dec. 15, 2009 from 1:30-3:30 PM
You cannot pass the course without taking the final.

Laboratory

The experiments in the laboratory are an integral part of this course. Ten (10) experiments are scheduled. All must be done. You cannot pass this course unless you do every experiment, and submit a report.

Grading

Your grade is figured out as follows:

Best 8 of 10 Quizzes	100
Lab Reports	100
Best 2 of 3 "hourlies"	200
Final Exam	200
*Discussion	≤ 50 (Bonus)

*Note: You earn 50 points if you have 5 visits prior to every exam and you have a perfect score on every exam (100+100+100+200)/10!

Extra Help

a) The instructor is available for discussion at all times. I am usually in my office (Z-2331) or laboratory (Z-2221) from about 9:30 AM to about 6:00 PM, Monday through Friday. Feel free to walk in. If you desire an especially extended visit, call 56144 or 56159 to ensure that I have a time slot free. If you have any difficulty at all, never hesitate to drop by. Also I keep a record of your visits. You can earn up to 50 points (or 10 percent of your earned grade points) by showing up with questions*. You may call me at home (301-345-5308) but no later than 10 PM.

b) T.A.'s will post their office hours

c) Slawsky Clinic is an excellent (free) tutoring service. It is staffed by very dedicated physicists who can help improve your problem solving skills. Do take advantage of this highly acclaimed feature of the physics department.

Date			Subject/Chapter	Problems
wk1	Aug 31	M	Review 121	Diagnostic
	Sept 2	W	14 Oscillations	14- 4, 7, 17, 20
	4	F	Oscillations	14- 26, 44, 49, 55
wk2	Sept 7	M	LABOR DAY	
	9	W	14/15 Mechanical Waves	S- 1, 2, 3, 4, 5
	11	F(Q)	15 M. Waves	15- 2, 13, 22, 25, 30
wk3	Sept 14	M	15 Sound	15- 35, 37, 44, 47
	16	W	15 Sound	S- 6, 7, 8; 15- 71
	18	F(Q)	15 EM Waves	S- 9, 10; 15- 64; 16-9, 12, 18
wk4	Sept 21	M	16 Sound	16- 20, 26, 30, 36, 45, 56
	23	W	17 Light	17- 2, 4, 8, 9
	25	F(Q)	17 Light	17- 12, 13, 15, 21
wk5	Sept 28	M	17 Light	17- 26, 29, 31, 32
	30	W	18 Ray Optics	18- 8, 11, 12, 21
	Oct 2	F	**EXAM I**	
wk6	Oct 5	M	18 Ray Optics	18- 24, 28, 29, 34
	7	W	18 Ray Optics	18- 41, 45, 51, 57, 65
	9	F(Q)	20 Charge	20- 3, 12, 15, 23
wk7	Oct 12	M	20 $\vec{E}$-Field	20- 28; S- 11, 12
	14	W	20 $\vec{E}$-Field	S- 13, 14, 15, 16
	16	F(Q)	20 $\vec{E}$-Field	20- 40, 52, 64, 65
wk8	Oct 19	M	21 Potential	S-17, 18, 19; 21- 3
		W	21 Potential	21- 8, 15, 22, 27; S-20
		F(Q)	21 Potential	21- 33, 41, 51, 62, 69
wk9	Oct 26	M	22 Current	S- 21, 22, 23, 24
	28	W	22 Resistance	22- 10, 13, 20, 31
	30	F(Q)	22 Resistance	22- 33, 38, 50, 60
wk10	Nov 2	M	23 Circuits	S- 25, 26, 27; 23- 5
	4	W	23 Circuits	23- 12, 17, 22, 34
	6	F	**EXAM II**	
wk11	Nov 9	M	23 Circuits	23- 37, 39, 48, 65, 70
		W	24 $\vec{B}$-Field	S- 28, 29, 30, 31
		F(Q)	24 $\vec{B}$-Field	S- 32, 33, 34, 35
wk12	Nov 16	M	24 $\vec{B}$-Field	24- 4, 15, 28, 31
	18	W	24 $\vec{B}$-Field	24- 33, 41, 51, 55, 59

		20	F(Q)	25 EM Induction	25- 9,15, 27, 53
wk13	Nov 23	M		25 EM Induction	S- 41,42,43,44
		25	W(Q)	25 Maxwell's Eqns	S- 45,46,47; 25- 62
		27	F	THANKSGIVING	
wk14	Nov 30	M			
	Dec 2	W			
		4	F	**EXAM III**	
wk15	Dec 7	M			
		9	W	Review	
		11	F	Review	

FINAL EXAM: Tuesday, Dec 15, 1:30--3:30 pm