1998

COURSE INFORMATION - PHYSICS 104 - SPRING 1997 - draft

INSTRUCTORS

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COURSE MATERIALS

- College Physics: Serway & Faughn [Saunders College Publishing, Fourth Edition]
- Physics 104 Lab Manual
- an inexpensive calculator with exponential and trig functions
- additional materials are available in the Physics Library [4220 Chamberlin] and on the Physics Department's Physics 104 web site http://www.physics.wisc.edu/~phys104/

LECTURES

- The lectures will introduce the principles discussed in the chapters, provide an outline and guide to the material, and illustrate the physics with example problems and demonstrations.
- Instructions, exam room assignments, notes, worked out example problems, and review and equation sheets will be distributed at the lectures [copies available in the Physics library].

EXAMS

- There will be three 75-minute exams on Feb. 19, Mar. 19 and Apr. 16 [Thursdays] at 7:30 PM [see the Syllabus]. Note that 75 minutes of the 90 minutes listed in the timetable will be used for the exams. A 2-hr final exam is scheduled for May 11 at 5:05 PM.
- Bring a calculator with charged batteries to the exams.
- An example *help sheet* will be distributed before the first exam. You should write out and *bring your own help sheet to each exam* [one 8X11 sheet]. Text books ARE NOT permitted.
- ALTERNATIVE EXAM CONDITIONS: To arrange for alternative exam conditions, present the original and a copy of your McBurney VISA to the course instructor at least two weeks before the first exam. Write your phone number and/or E-mail address on the copy. The instructor will notify you of the location where the exams will be given.
- There will be NO MAKEUP EXAMS. If you have a conflict with the exam schedule, or if you are uncertain that you can take the exams at the scheduled times, you should drop the course. You can request to miss one exam if there is a conflict with a university sponsored event [see below], religious observance, etc. A formal request to the instructor must be made during the first two weeks of the semester. If you miss an exam due to a medical emergency, etc., you must present written evidence from a physician, dean or academic advisor [notify your TA and Carlsmith or Quin of your absence by phone or E-mail, if possible before the exam].
- PARTICIPATION IN UNIVERSITY SPONSORED EVENTS: To arrange for an excused exam for participation in a university sponsored event, present a letter from the athletic or fine arts department, etc., to the instructor during the first two weeks of the semester. The letter must include your name and student ID number, and the name and phone number and/or E-mail address of the sponsor making the request.

HOMEWORK

- We encourage students to discuss the lecture material, text examples and homework problems with other students, the Physics 104 teaching staff, and with GUTS/HASH or other tutors. However, the homework solutions you turn in are expected to result mainly from your individual effort. Evidence of coping or excessive collusion will result in reduced homework scores.
- The homework is due in the boxes at the entrance to the lecture hall before your lecture on Wednesday [see the syllabus for assignments and due dates]. The boxes are labeled by discussion section number, so write your section number on the homework. Two problems from each assignment will be graded [0, 1 or 2 points per problem, plus 1 point if most of the assignment is completed]. Late homework will not be accepted.
- Solutions to the homework will be on reserve in the Physics Library.

DISCUSSION SECTION QUIZZES

- Short quizzes will be given during the discussion sections in the week preceding each exam [2/12, 3/5, 4/9 and 4/30]. Your best three quiz scores [10 points each] will be used to obtain your quiz grade.

LABORATORIES

- You must attend the lab section for which you registered.
- If you miss more than one of the 11 labs, your final letter grade will be lowered by one grade (e.g. B => C) for each additional lab missed.
- Lab scores will be based on your participation in the lab and on a lab report. The 11 lab grades [approximately 30% +, 40% √, 30% –, averaged over all lab sections for each TA] will be converted to a numerical score. A score of 0 will be given if a lab is missed, and an unacceptable lab report (grade = U) must be redone. In the rare cases when you miss a lab, it is your responsibility to make up the lab during the same or the following week. Talk to your TA to arrange for a makeup lab.
- Exam questions based on the lab experiments are not unusual.

FINAL GRADE

The final grades will be curved [class median is above the B/BC cut] and computed from:

- homework [6%], discussion quizzes [3%], and labs [11%]: 20% total
- three one-hour exams, equally weighted: 50%
- final exam [cumulative]: 30%.

OFFICE HOURS

- Professors Carlsmith and Quin will have office hours in their respective offices on Monday at 3:30 PM and Tuesday at 2:00 PM. For help at other times make an appointment before or after a lecture.
- The schedule of TA office hours is on the back of the syllabus. All TA office hours will be held in the consultation room [Room 2315, Sterling Hall].
- You may go to the office hours of any TA.

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Text: Serway and Faughn, College Physics 4th edition

DATE	CHAPTER	HOMEWORK (due date)	LAB
W Jan 21	Ch15: Electric Forces & Fields	Ch 15: 4,5,10,12,13,19,26,33,36,	no lab
F Jan 23	Ch15 (including pp. 1037-1041)	41,61,66; & p. 1042 4,7 (1/28)	
M Jan 26	Ch15		E2: Electric Fields
W Jan 28	Ch16: Electric Energy & Capacitance	Ch 16: 3,6,20,21,23,26,31,	
F Jan 30	Ch16	40,44,51,55,65,75 (2/4)	
M Feb 2	Ch16		E1: Electrostatics
W Feb 4	Ch 17: Currents	Ch 17: 4,5,8,24,46,50,58 (2/11)	
F Feb 6	Ch 17		
M Feb 9	Ch 18: Direct Current Circuits	Ch18: 3,13,15,17,18,23,26	E4: DC Circuits
W Feb 11	Ch 18	34,40,47,51,57,61 (2/18)	
F Feb 13	Ch 19: Magnetism	Ch. 19: 5,11,16,23,24,30,36	
M Feb 16	Ch 19	40,49,53,57,60,73 (2/25)	no lab
W Feb 18	REVIEW		
R Feb 19	**EXAM 1 Ch 15 -18 (7:30 - 8:45 PM)**		
F Feb 20	Ch19		
M Feb 23	Ch 20: Inductance	Ch 20: 5,14,21,26,34,41,56,66 (3/4)	E7: Induction
W Feb 25	Ch 20		
F Feb 27	Ch 20		
M Mar 2	Ch 21: AC Circuits	Ch 21: 2,5, 10,12,16,18,19,22,24,	E8: Oscilloscope
W Mar 4	Ch 21	27,29,30,32,35,36,42,43 (3/18)	
F Mar 6	Ch 21		
	Spring Recess March 7 - 15		
M Mar 16	Ch 21: Waves, Ch 22: Reflection	Ch 21: 48, 51, 57, 61, 77 (3/25)	E9A: AC Circuits
W Mar 18	REVIEW		
R Mar 19	**EXAM 2 Ch 19 - 21 (7:30 - 8:45 PM)**		
F Mar 20	Ch 22: Refraction	Ch 22: 8,13,15,20,27,42,60 (3/25)	
M Mar 23	Ch 23: Mirrors and Lenses	Ch 23: 4,6,11,16,29,34,	L2: Lenses
W Mar 25	Ch 23	40,4445,60,61,68 (4/1)	
F Mar 27	Ch 23		
M Mar 30	Ch 24: Wave Optics	Ch 24: 5,10,14,20, 23,29,	L3: Telescope and
W Apr 1	Ch 24	33,40,46, 50, 63 (4/8)	Microscope
F Apr 3	Ch 25: Optical Instruments	Ch 25: 7,8,10,11,16,20,24,26,	
M Apr 6	Ch 25	33,41,45,50,62,70 (4/15)	no lab
W Apr 8	Ch 25		
M Apr 13	Ch 26: Relativity	Ch 26: 4,19,44,47 (4/22)	no lab
W Apr 15	REVIEW		
R Apr 16	**EXAM 3 Ch 22 - 25 (7:30 - 8:45 PM)**		
F April 17	Ch 27: Quantum Physics	Ch 27: 3,4,13,18,21,24,29,	
M Apr 20	CH 27	42,48,51,59,68 (4/22)	L4: Eye
W Apr 22	CH 27		
F Apr 24	Ch 28: Atomic Physics		
M Apr 27	Ch 28	Ch 28: 1,3,4,10,18,31,32,	L5: Spectrum of
W Apr 29	Ch 28	38,39,46,48,51 (4/29)	Hydrogen
F May 1	Ch 29: Nuclear Physics		
M May 4	Ch 29	Ch 29: 4,9,14,18,24,29,	N2: Radioactivity
W May 6	Ch 29	34,36,42,59 (5/6)	
M May 11	**FINAL EXAM (5:05 PM)**		

PHYSICS 104 II-1998 – COURSE MEETING – 1/19/97 3:30 PM IN 4405 STERLING

Bring your class and final exam schedule to the meeting

- TODAY: Fill out before the meeting [8 AM Tuesday 1/20/97 at the latest] the attached class-schedule card. On the back of the card give your office number(s), office phone number(s), home phone number [kept confidential], and E-mail address.
- TODAY: Select the days and times for your consultation room assignment.

TEACHING PHYSICS 104

- Physics 103-4 is a very hard course for many students – maybe the hardest course they will take at the UW. For most students the material is new. Nearly all have difficulty developing a qualitative understanding, and they find the quantitative approach a challenge and the pace frantic! Your job, and it is fun, is to guide, help, and reassure them. The students are in general rather good, so do not put them down or discourage them if they don't catch on right away. If after the first exam you find that a student is completely unprepared or really in trouble, suggest that he or she discuss their situation with Duncan or Paul. You should follow up. E-mail us or check at the weekly meeting to see if the student came by.
- Coulomb's law is straightforward. However, students have real trouble understanding electric and magnetic fields, symmetry arguments, capacitance, circuits, wave optics and modern physics, etc. Three things help. First, directly connect E&M units to forces, energy and power. Second, use drawings all the time: draw the charges, show the field lines, trace the rays -- don't just put equations on the board, draw, draw, draw. Third, whenever possible relate physics topics to their chemistry equivalent.
- Many students have trouble keeping the symbols and equations straight: using symbols rather than words increases their confusion. So, when you write equations on the board, make sure you say them in words rather than symbols. For example, $F = kqQ/r^2$ is "the force between two charges q and Q is directly proportional to the product of the charges, qQ, and inversely proportional to the square of the distance between them". Dimensional analysis helps, so make sure that students learn to feel comfortable checking the dimensions of their results.
- Metric units cause considerable problems. For that matter, so do standard American units. Admit that you also have trouble relating to Joules and N/C. Use volts when possible.
- Although many students have taken calculus, many others have trouble with arithmetic. The use of fractions and especially ratio techniques needs to be emphasized and demonstrated. Many students have forgotten how to use trig functions and radian measure, so spend extra time to make sure your problem solutions are clear when you decompose vectors or do problems with rotational motion. Graphical techniques are also new to many students. Use drawings and graphical examples frequently to give them experience with this approach. Do not try to impress the students with your math ability – use quadratic equations sparingly.
- Try to involve the students in the discussion. What equations would be useful to write down here? What should I draw here? What do I know? What to I want to find? How do I do that?
- Respect our students. It is inappropriate for an instructor at the University of Wisconsin-Madison to make negative or exclusionary remarks about an individual or group of individuals based on their religion, sex, race, national origin, gender preference, age, disability, or physical characteristics.

ORGANIZATION AND RULES

- Fair treatment requires all that TA's apply the rules uniformly. You are not allowed to change the rules because students in other sections will feel that they are at a disadvantage compared with your students. The rules can be bent only a little. For example, late homework is not accepted. However, answer YES to "I forgot my homework, can I bring it to you in half an hour? " and but NO to "... can I bring it to you tomorrow ?".
- You must also set and strictly enforce time limits for quizzes and exams. Some students have to leave for other classes or work, and it is unfair to allow a few students additional time compared to their classmates. If some students refuse to turn in their papers, announce that you will not accept papers after you leave the room, and then slowly leave!

GRADING

- The grading procedure is discussed in the course handout given to all students. For homework and labs the scale is very coarse to make it easier and faster for you to grade. Do not adopt a finer scale or use ½ points.
- Make sure that you keep hardcopy records of all scores. Up to date copies of your discussion, lab, and exam scores must be given to Duncan or Paul after each exam.

ASSIGNED DUTIES

- It is essential that you always meet your discussion sections, laboratory sections and consultation room assignments. If due to illness or other serious problems it is not possible for you to meet an assignment, you must try to arrange for another TA to replace you. If this fails, contact Duncan or Paul before the assignment is missed.
- The following table lists the duties that you are paid for. Attendance at the lectures can indeed be boring, but it is important that you see the notation used and the demonstrations and example problems. In addition, you have to appreciate the emphasis used by the lecturer as the many topics are discussed. Also, feel free and please correct Duncan or Paul if they make errors at the board: it is sometimes hard to think and write in the rush to finish a problem before the bell.

Assignment	nominal hours/week	hours	cumulative
Introductory meeting		2	2
Lecture attendance	3 (15 weeks)	42	44
Discussion sections	3 (15 weeks)	45	89
Laboratory sections	6 (11 weeks)	66	155
Consultation room	2 (14 weeks)	28	183
Course meeting	1 (13 weeks)	13	196
Exam review sessions		2	198
Exam proctoring		10	208
Discussion preparation	2 (15 weeks)	30	238
Laboratory preparation	2 (11 weeks)	22	260
Homework/Quiz grading	4 (14 weeks)	54	314
Laboratory grading	3 (11 weeks)	33	347
Exam grading		0	347
Final meeting		2	349

Physics 104 – Spring 1998 – TA class schedule

NAME_____

give course number, section, etc.

	Monday	Tuesday	Wednesday	Thursday	Friday
7:45					
8:50					
9:55					
11:00					
12:05					
1:20					
2:25					
3:30					
4:35					
5:45					
7:05					

NAME_____

PHYSICS OFFICE_____ PHONE_____

OTHER OFFICE_____ PHONE_____

E-mail_____

HOME PHONE_____

FINAL EXAM SCHEDULE

COURSE 104 TIME 5:05 PM Monday 5/11

COURSE_____ TIME _____

COURSE_____ TIME _____

COURSE_____ TIME _____