

UCSD DEPARTMENT OF PHYSICS

Physics 1B

SYLLABUS

Fall 2009

September 17, 2009

General Physics –Electricity and Magnetism (Lecture)

PROFESSOR:

Brian Keating

Office: 333 SERF Building

Office Hours: Mondays 2:00 pm

Email: bkeating@ucsd.edu

Phone: 534-7930

TEACHING ASSISTANT:

Nasim Eibagi

Email: neibagi@gmail.com>

Office hrs: Tuesdays 4p to 6p in Tutor center (Mayer Hall Annex room 2702)

CLASS SCHEDULE:

Lectures: MWF 1:00 – 1:50 pm York 2622

Four Quizzes: Fridays 10/9, 10/23, 11/6, 11/20 1:00 – 1:50 pm York 2622

Problem Sessions: Thursday nights 8-9:50pm in Solis Hall Room 104

Final Exam: Monday December 7, 2009 in York Hall, 11:30am to 2:29pm

TEXT:

Authors: Serway & Faughn, Title: **College Physics, 7th Edition**, Thomson/Brooks/Cole.

REQUIRED CLICKER: InterWrite Personal Response System (PRS). Available at Price Center Bookstore. See <http://clickers.ucsd.edu/> We are one of the courses at UCSD to use this innovative (electromagnetic) tool. The benefits of clickers, for both long and short term retention of complex material, have been proven. In 1B your clicker will be used for participating in class discussions and for obtaining Extra Credit.

UPDATES: Urgent announcements and information will be distributed on the course website. The syllabus may be altered at any time so check the course website at least once per week.

PREREQUISITES: Math 10A and concurrently enrolled in 10B or 20A. Trigonometry, vectors and basic calculus will be used in lectures, problem sets and exams.

COURSE FORMAT: The Physics 1A-B-C series is a lecture and laboratory course covering mechanics, electricity and magnetism, waves and modern physics. This sequence is **not** suitable for students majoring in Physics, MAE, ECE or CSE. Other majors should check with their departments for the appropriate sequence. In Physics 1B we will deal with electricity and magnetism, which is an extremely important branch of physics (and modern life!). A course schedule is attached. ***Concurrent enrollment in the laboratory course (Physics 1BL) is mandatory, but it is a separate course – you must register separately*** – check BLINK/Studentlink. The 1BL lab gives hands-on experience of the physical concepts dealt with in Physics 1B and is very useful. ***I do not have authority over enrollment in 1B or the 1BL lab. 1BL is required and you must register separately.***

HELP IS AVAILABLE. Here are some resources for your use:

1) Problem Session. A problem session will be held on Thursday evenings at 7pm in the HSS building. At these sessions the TA will work problems and go over the weekly lectures. Attendance is voluntary, but students are encouraged to use these meetings to help master course material and prepare for quizzes. Individual assistance is available during office hours.

2) Physics Evening Tutorial Center. The purpose of this Center is to provide a supplement to your lectures, TA discussion and/or problem sessions and office hours, irrespective of topic (mechanics, electricity and magnetism, basic astronomy, etc.). Students may come to the Center for personalized tutoring, individual and/or group assistance with homework, studying for quizzes or exams. The Center is located in Mayer Hall 2101. The hours of operation will be 3:00pm – 8:00pm, Sunday through Thursday nights, 2nd week through the 10th week.

HOMEWORK ASSIGNMENTS: Problem sets will be assigned as selections from each text chapter. Solutions will be available on the course web site. The problems will be worked in detail during the Thursday problem

session. The homework will not be collected or graded, but quiz problems will resemble assigned homework problems.

QUIZZES: A bi-weekly Quiz will be given on alternate weeks beginning the 2nd week. The quizzes will be on Fridays in lecture. There will be no quiz during the last (10th) week. ***You will be allowed to drop one quiz. There will be no make-up quizzes. If you miss a quiz you can use this as the one to drop. You must purchase your own Scantron forms for quizzes. They are available at the Bookstore (no. X-101864-PAR) and the general store co-op. You will need a No. 2 pencil to fill in the Scantron.*** You will be allowed to use a simple scientific calculator for all of the quizzes and the final, but no laptops or cell-phones or notes.

Week	Date	Topic	Chapter	Problems**
1	F 9/25	Welcome to 1B! Introduction:Charges, Insulators,Conductors	15.1-15.2	
	M 9/28	Coulomb's Law	15.3	1, 10, 11,13, 15, 48
	W 9/30	Electric Field and "Electric Field Lines"	15.4-15.5	17, 20, 24, 27
	F 10/2	Electrostatic Equilibrium/Millikan Expt.	15.6-15.8	28, 30
2	M 10/5	Millikan Experiment and Gauss' Law (1/2)	15.7-15.8	32, 36
	W 10/7	Gauss' Law (2/2)	15.9	38, 43, 46
	F 10/9	QUIZ 1 CHAPTER 15		
3	M 10/12	Electric Potential & Equipotential Surfaces	16.1-16.4	1, 3, 5, 8,12, 15, 19
	W 10/14	Equipotential Surfaces & Capacitance	16.5-16.7	22, 23, 25
	F 10/16	Capacitor Combinations	16.8	29, 31 33, 35
4	M 10/19	Energy, Dielectrics	16.9-16.10	43, 45, 47, 49,60
	W 10/21	Electric Current	17.1-17.3	1, 3, 8,9
	F 10/23	QUIZ 2 CHAPTER 16		
5	M 10/26	Resistance, Ohms' Law	17.4-17.7	11, 13, 16, 19, 20,23, 52
	W 10/28	Resistivity, Electric Power	17.8	31, 33 39, 45, 60
	F 10/30	Sources /Resistors - Series and Parallel	18.1-18.3	1, 3, 5, 7, 13
6	M 11/2	Kirchoff's Rules, RC circuits (1/2)	18.4	17, 21, 26
	W 11/4	RC circuits(2/2)	18.5	31, 33,35
	F 11/6	QUIZ 3, CHAPTER 17 & 18		
7	M 11/9	Magnetism! (Ch 19)	19.1-19.3	1, 3, 8, 9
	W 11/11		19.4-19.5	11, 15, 19, 22, 24
	F 11/13	Magnetic forces on charges & currents Torque on current loop		
8	M 11/16	Motion of charge, Ampere's Law	19.6-19.8	27, 29, 34, 37, 38, 41, 44
	W 11/18	Current loop, solenoid, permanent magnet	19.9-19.11	47, 49, 57, 61
	F 11/20	QUIZ 4, CHAPTER 19		
9	M 11/23	Induced EMF, Faraday's Law	20.1-20.2	1, 5, 8, 11, 13 16
	W 11/25	Motional EMF, Lenz's Law	20.3-20.4	18, 19, 23, 25, 27, 29
	F 11/27	Thanksgiving Holiday		
	M 11/30	Generators, Inductance	20.5-20.6	31, 34, 37, 39
10	W 12/2	RLC Circuits	21.1-21.7	1, 11, 15,19,33, 41
	Th 12/3	REVIEW FOR FINAL EXAM		
	F 12/4	Electromagnetic Waves	21.8-21.11	45,46, 48

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FINAL EXAMINATION: The final examination will cover all of the material of the course. **Please check your final exam schedule and inform instructor of any conflicts within the first two weeks of quarter. There will be NO make up quizzes/make up final.**

<u>GRADING POLICY</u>	Quizzes	60% (best 3 out of 4)
	Final Exam	40%
	Extra Credit	5% (applied in class using Clicker responses)

ADD/DROP

Use WebReg to add/change/drop, drop from waitlists. See the Physics Department, Student Affairs Office, Urey Hall Addition, Room 115, if you have problems with WebReg. If you need advice, you can ask the Physics Student affairs office but do not ask the TA or me – we cannot, and do not, sign any cards.

ACADEMIC DISHONESTY: Please read "UC Policy on Integrity of Scholarship" in the UCSD General Catalog. The Policy regarding Academic Dishonesty will be rigorously enforced. In Ph 1B cheating includes submitting another person's work as your own for grade consideration, copying from another student on assignments, quizzes or the final exam or knowingly allowing another student to copy from you. Cheating also includes the use of any unauthorized materials in a quiz or exam. *Any confirmed case of cheating will result in an "F" grade in Physics 1B and referral to the dean for disciplinary action.*

DEADLINES

Last day to add a class: October 9

Last day to drop a class w/o a W and change grade option: October 23

Last day to drop a class **with** a W (but without an F!): November 30

Last day of class: Friday December 4

1B "PHILOSOPHY"

This class is not particularly easy, but it is also not a class meant only for "science nerds" (even though your professor is one). The one sure thing is that the harder you work, the better you will do. You are *much more likely* to do well if you do the HW assignments. It is easy to fall behind on the reading and on the HW assignments so be careful. 1B is a fast-paced class that relies on self-motivation and hard work. Please note: 1B is not an "MCAT test preparation course" – there are many other commercial sources that perform this function (and they are much cheaper than UCSD courses!). Additionally, there are many students in 1B who are not pre-medical students but interested in the material for their own benefit. In fact, 1B is probably one of the most useful and practical classes you may take at UCSD. Electricity and magnetism are encountered more than any other aspects of physics (except for gravity, perhaps, because it keeps us attached to the earth). My goal is to get you to understand the physics behind the equations, how to think critically, and how to become comfortable with complex concepts...and hopefully you will enjoy it along the way.

CLASS SCHEDULE (Note: Schedule may change, check Physics 1B website frequently)

Text: Serway & Faughn, College Physics, 7th Edition

**In addition to the problems, try to solve the odd numbered conceptual questions. The answers are at the back of the book.