

University of South Carolina
Department of Physics

Physics 212
Spring 2012

Dr. R. A. Webb

TITLE: Physics 212 General Physics: Electric charge, electric and magnetic fields, potential, resistance, ac and dc circuits, and magnetism.
The second semester of the two term sequence on introduction to classical physics for scientists. Prerequisites: Grade of C or better in Physics 206 or 211 and Math 142.

INSTRUCTOR:

Professor R. A. Webb (rawebb@physics.sc.edu) Room 125 Sumwalt Phone: 7-9987

SCHEDULE: MWF 9:05 – 9:55 AM Lecture --Room PSC 205

Recitation: Tuesday 2:00-3:15 PM--Room 205

OFFICE HOURS: To be determined on first day of class **and by appointment.**

REQUIRED TEXT:

University Physics by Wolfgang Bauer and Gary D. Westfall, 1st Edition, McGraw-Hill Companies, Inc., John Wiley & Sons. We will attempt to cover all or part of chapters 21-34. Supplementary handouts as needed

LECTURES:

You will be responsible for material presented in lecture that is not in the book. Occasionally we will have a demonstration that may serve as the basis for an exam question. If you miss a lecture you are responsible for finding out from a classmate what we did in class.

HOMEWORK:

The first homework assignment is attached to this handout. *Homework solutions must be handed in at the **beginning** of the Tuesday recitation class on the due date indicated on the Assignment Sheet. **Late homework will not be accepted.*** You must write on every page of your homework (a) the assignment number, and (b) your name. Homework papers must be stapled. **The importance of completing the homework on time cannot be over emphasized.** There is no better way to learn the material and prepare for examinations than by practicing with the types of questions and problems in the homework. The homework will not be returned but will be discussed in the recitation class or my office hours.

QUIZZES: A short (~10 min.), “closed-book” quiz will be given at the end of most recitation classes. This quiz will typically consist of several multiple choice questions as well as a single question or problem selected from, or similar to, the assigned homework. Make-up quizzes will not be given without prior arrangements. You will need to bring a scientific calculator for the quizzes, tests, and final. Graphing calculators, PDA’s, and other instruments with large memories are not allowed.

EXAMS:

There will be *three 50 minute, closed-book, closed-notes exams* given during the lecture period on dates listed in the schedule. Each exam will be based on the chapters indicated with at least half of each exam consisting of problems similar to assigned homework problems. Calculators are necessary in exams and quizzes. However, in grading we are looking more at the reasoning that you use rather than at the final numbers. *The three-hour closed book, closed notes final exam is scheduled to be given on Wednesday **May 2, 2:00-5:00 pm*** at a location to be announced. You must take the final exam to receive a course grade. **You are responsible for material discussed in class, even if it does not appear in the textbook. You are also responsible for material assigned for reading even if it is not discussed in the lectures.**

RECITATIONS:

The primary goal of recitation sections will be to help you develop both your understanding of physics and problem solving skills. The recitation belongs to you — it is not supposed to give me practice in lecturing! Ask questions. If you find the recitations are not helpful, or could be improved in some concrete way, then please tell me.

GRADING:

50-minute exams (100 pts. each)	300 pts.
Final Exam	180 pts.
Quizzes	100 pts.
Homework	<u>70 pts.</u>
Total	650 pts.

I will assign final grades based upon your mastery of the material. There are no absolute predetermined numerical scores necessary to achieve an A,B,C, D, or F. Experience has shown, however, that if you do not do the homework or take the quizzes it is unlikely that you will be able to earn a grade better than a D. Historically, the final grade distribution has been near:

85% and up	A	57-63%	C
80-84%	B+	50-56%	D+
74-79%	B	44-49%	D
64-73%	C+	Below 43%	F

VALID EXCUSES:

If you have a valid excuse for missing an exam or quiz, (e.g., you will be having an operation or will be in jail) see me to arrange what to do about it, beforehand if at all possible. Ex post facto (after the fact) excuses will require validation and may not be acceptable. It is extremely difficult to construct make up exams or quizzes that have exactly the same level of difficulty as the original one. You must speak to me.

ACADEMIC DISHONESTY (CHEATING):

Academic dishonesty (cheating, plagiarism, copying from old assignments, etc.) is a serious offense that I do not tolerate and will normally result in failure of the course. Assisting or knowingly cooperating in academic dishonesty will also result in failure of the class. All incidents of academic dishonesty will be reported to the student's College for possible further disciplinary action. It is the responsibility of every student at the University of South Carolina Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this Honor Code or who knowingly assists another to violate this Honor Code shall be subject to discipline.

IMPORTANT DATES TO REMEMBER:

Jan. 13th	Last day to drop or add without a grade of W
Feb. 27th	Last day to drop this course without "WF" (This is after the 1st Exam!)
May 2nd	Final Exam 2:00-5:00 pm RM 214

TIPS FOR DOING WELL IN THIS COURSE:

- ① Read the book *before* and *after* the material is covered in lecture.
- ② Freely ask questions both in lecture and in recitation.

- ③ Work all of the homework questions and problems. You are allowed and encouraged to discuss homework with anyone you wish. However, in order to really learn, don't just copy solutions from somewhere or someone else; rather, work through them in detail yourself. Afterwards, make use of the discussion period and me to make certain you understand all of the solutions. The quizzes and exams will involve homework problems.
- ④ Seek help immediately if you do not understand the material or can't solve the problems. Help is available from me. Don't wait until just before the exams.
- ⑤ Remember that you are responsible for material discussed in class, even if it does not appear in the textbook. You are also responsible for the material assigned for reading in the text and the handouts even if it is not discussed in lecture.

Goals

By the end of this course, the successful student should be able to describe and calculate the forces on matter due to both electric and magnetic fields; analyze simple circuits and electrical networks; and solve basic problems in wave propagation and optics.

TENTATIVE SCHEDULE

DATE	DAY	SUBJECT	HOMEWORK ASSIGNMENT Date due (HRW)
Jan. 09	M	Introduction & Electrostatics	Read Ch. 21
10	Tu	Electrostatics & Problems	
11	W	Electrostatics & Electric Fields	Read Ch. 22
13	F	Electric Fields	
16	M	NO CLASS	
17	Tu	Problems & Quiz on Chapter 21	Ch. 21 & 22 HW due
18	W	Electric Fields & Gauss' Law	
20	F	Gauss' Law	
23	M	Gauss' Law	Read Chapter 23
24	Tu	Quiz on chapter 22	Ch. 22 HW due
25	W	Electric Potential	
27	F	Electric Potential	
30	M	Electric Potential	
31	Tu	Exam Review	Ch. 23 HW due
Feb. 01	W	Exam #1 (Ch. 21-23)	Read Chapter 24
03	F	Capacitance	
06	M	Capacitance	Read Chapter 25
07	Tu	Quiz on Chapter 24	Ch. 24 HW due
08	W	Current & Resistance	
10	F	Current & Resistance	Read Chapter 26
13	M	DC Circuits	
14	Tu	Quiz on chapter 25	Ch. 25 HW due
15	W	Circuits	
17	F	RC Circuits	Read Chapter 27
20	M	Magnetism	
21	Tu	Quiz on chapter 26	Ch. 26 HW due
22	W	Magnetic Fields	
24	F	Magnetic fields due to currents	Read Chapter 28
27	M	Magnetic fields due to currents	
28	Tu	Exam Review	Ch. 27 HW due
29	W	Exam #2 (Ch. 24-27)	Read Chapter 29
March 02	F	Electromagnetic Induction	
4-11	MWF	Spring Break	
12	M	Electromagnetic Induction	
13	Tu	Quiz (Ch. 29)	Ch. 28 HW due

	14	W	Electromagnetic Induction	Read Ch. 30
	16	F	AC Circuits	
	19	M	AC Circuits	Read Ch. 31
	20	Tu	Quiz (Ch. 30)	Ch. 30 HW due
	21	W	AC Circuits	Read Chapter 32
	23	F	Maxwell's equations	
	26	M	Maxwell's equations	
	27	Tu	Quiz (Ch. 31)	Ch. 31 HW due
	28	W	Electromagnetic Waves	
	30	F	Electromagnetic Waves	
April	02	M	Electromagnetic Waves	Read Chapter 33
	03	Tu	Quiz (Ch. 32)	Ch. 32 HW due
	04	W	Images	
	06	F	Images	
	09	M	Interference	
	10	Tu	Exam Review	Ch. 33 HW due
	11	W	Exam #3 (Ch. 29-32)	Read Chapter 34
	13	F	Interference	
	16	M	Interference	
	17	Tu	Quiz Ch. 34 (Interference)	Ch. 34 (part 1) HW due
	18	W	Diffraction	
	20	F	Diffraction	
	23	M	Diffraction/Final review	Ch. 34 (part 2) HW due
May	02	W	Final Exam 2:00-5:00 pm	

First Homework Problem Set for Dr. Webb's 2011 Physics 212 Class

University Physics by Wolfgang Bauer and Gary D. Westfall, 1st Edition, McGraw-Hill Companies, Inc., John Wiley & Sons.

HW Assignment #1: (Due Jan. 17th at beginning of class)
Ch. 21: Q: 21, 22, 23; P: 27, 41, 52, 55, 69, 80, 81
Ch. 22: Q: 12, 22; P: 27, 31