

PHYS 1304: Introduction to Electricity & Magnetism, Fall 2012

General information

Time and location:	Tuesday, Thursday, 11:00-12:20pm, 123 Fondren Science
Instructor:	Pavel Nadolsky
E-mail:	nadolsky@smu.edu
Phones:	(214) 768-1756 (office), (214) 577-6899 (mobile+text message)
Mailbox:	102 Fondren Science
Office:	203 Fondren Science
Office hours	Tuesdays, 3-5pm (appointments+walk-ins); Wednesdays, 2-4pm (appointments). The sign-up sheet for appointments is posted in the blue menu on Blackboard.
TAs	Hang Qiu hangq@smu.edu Office: Fondren Rm 41 Office hours: Wednesdays, 4-5pm, or by appointment
Homework help session	Tuesday, 5-7pm, Fondren 157
Course webpage	Posted on SMU blackboard (courses.smu.edu), also accessible from http://www.physics.smu.edu/~nadolsky/teaching.html . To view, enter your 8-digit SMU ID and password.
News and announcements	Distributed through e-mail and the course webpage
Email me when...	... your question takes more than 1 minute to answer. The breaks before and after the lecture are short (10 minutes each), and often several students line up with their questions. I may be able to answer better by email.

Learning objectives, assignments, grading

Learning outcomes The course will discuss physical principles of electrical and magnetic effects and aims to develop two equally important abilities: (1) to analyze and explain common electromagnetic phenomena in terms of standard concepts; and (2) to solve conceptual and quantitative problems describing electromagnetic effects.

The course satisfies the University Curriculum (UC) requirement. Upon its successful completion, students will meet these expectations from the Quantitative Reasoning student learning outcomes:

- Students will be able to develop quantitative models appropriate to problems in physics
- Students will be able to apply symbolic systems of representation

Students will also meet these expectations from Pure and Applied Sciences student learning outcomes:

- Students will be able to demonstrate basic facility with the methods and approaches of scientific inquiry and problem solving
- Students will be able to explain how the concepts and findings of science or technology in general, or of particular sciences or technologies, shape our world

Textbook [Fundamentals of Physics \(SMU 9th edition, Chapters 21-36\)](#) by D. Halliday, R. Resnick, and J. Walker. ISBN: 9781118141519 . **You must subscribe to the WileyPLUS online learning system that comes with this textbook.** See the instructions on how to purchase WileyPLUS below.

Elective material

1. [Introductory Physics II](#): free interactive summaries and practice quizzes (in Adobe Flash) on www.hippocampus.org
2. [Calculus-based physics, 2nd semester](#), by Jeffrey W. Schnick. A free textbook available on the Internet in Adobe PDF or Microsoft Word formats; contains concise summaries of physics topics we discuss
3. [Interactive E & M simulations at University of Colorado](#) -- hand-on Java applets illustrating E & M concepts. A Java virtual machine needed to run the applets can be freely downloaded [here](#) and easily installed on any computer platform.
4. A problem-solving manual covering Introductory Physics II, for example:
 1. A. Halpern, A. Halpern, 3,000 Solved Problems in Physics (Schaum's Solved Problems), **ISBN-10:** 0070257345; **ISBN-13:** 978-0070257344
 2. T. Barrett, Introductory Physics with Calculus: Mastering Problem-Solving, **ISBN-10:** 0471739103, **ISBN-13:** 978-0471739104
 3. R. Oman, D. Oman, How to Solve Physics Problems (College Course), **ISBN-10:** 0070481660, **ISBN-13:** 978-0070481664

Structure of the lectures

This course follows an interactive format and extensively utilizes student response systems (**clickers**). It is not a traditional "one-way" lecture that simply repeats what is written in the textbook. **Plan to learn mostly by reading the textbook and by actively engaging in learning activities inside and outside of the class under my guidance.** The in-class time will be mostly spent on experimental demonstrations, discussion of difficult points, problem solving, and hands-on activities.

On a typical week you will do the following:

1. Read a new chapter in the textbook by Monday
2. Solve a few warm-up questions or puzzles and submit them through the PHYS 1304 website by 7am on Tuesday
3. In the Tuesday class, collectively review your answers to the warm-up questions
4. [Strongly recommended] Come to a problem-solving help session at 5-7pm on Tuesday. We will discuss typical exam problems.
5. Solve homework problems on WileyPLUS by 7am on Thursday; turn in a written solution for one problem from this homework set in Thursday class
6. Participate in interactive learning activities during the rest of the classes

Homework issues

In the past, students have spent at least 3 hours on reading the assigned chapters in the textbook or viewing elective materials (such as tutorials on hippocampus.org). After you finished reading, answer 2-3 warm-up puzzles in the "Assignments/Warm-ups" section of this website, with the submission due by **Tuesday morning**.

The second homework assignment (7-10 problems) is administered through WileyPLUS and is due by **Thursday morning**. One problem from each homework set will be selected for manual grading, and **its hard copy must be turned in to me or Hang (our TA) before the end of Thursday**. If you don't make this deadline, you can turn in this problem **only** through a web form in the "Assignments/Late homework submission" section of this website until the end of the next Monday for 50% of the full credit.

Exams

There will be two midterm tests and a final exam. These are closed-book exams, but formula sheets will be provided.

Composition of the grade

- 15+15+15=45%: 3 tests
- 20%: Warm-ups, in-class activities, occasional surveys; graded on effort
- 35% = 150 points for homework problems; more than 35%, if more than 150 points are earned. The points are earned as follows:
 - 1. Weekly homework assignments: a fully solved WileyPLUS problem = 1 point; the manually graded problem = 2 points
 2. Participation in 1 help session on a Tuesday evening = 5

points

3. 1 completed GO tutorial on WileyPLUS, with a turned-in hard copy of the solution = 1 point

Letter-grade break points

The final grade is determined by your cumulative score for all assignments, expressed as the percentage of the largest score possible. The approximate breakdown is

83 < A < 100%
78 < A- < 83
74 < B+ < 78
71 < B < 74
67 < B- < 71
63 < C+ < 67
55 < C < 63
50 < C- < 55
40 < D < 50
F < 40

Boundaries between the grade intervals may shift up or down by a few percent depending on the actual distribution of the scores.

Extra credit assignments

Can earn you bonus points that can bring your total score above 100%. Will be based on individualized tasks, such as a term paper on the Gauss law. Ask me how!

Clickers

In the class, each student is assigned an individual response card (*clicker*) with a unique ID for the whole length of the course. Write down your clicker's ID in your notes, pick it up from the instructor at the beginning of the class and return at the end. Please note that students are responsible for keeping their clickers in a working condition. You need to check the battery at the beginning of each class. If the clicker is damaged or lost, it will be difficult, if ever possible, to replace it.

Other policies

Attendance

Six (6) unexcused absences result in automatic failure of this course. Attendance is tracked based on the records of your clicker responses and paperwork submitted in the class.

Laptops, tablets, smartphones

Can be only used for activities related to our class, such as reading the Halliday's textbook or for mathematical computations.

Medically excused absences

Follow SMU-wide guidelines as specified by the Provost. Verification of medical illness and request for an excused absence from class will be handled in one of two ways. A physician or staff member from health/counseling and testing will provide either (1) a hand-written note on a Health Center prescription form, or (2) a signed letter written on Health Center stationery. Excused medical absences shall have specific dates of time periods indicated. Encounter forms and walk-out Statements verify a student's visit to the Health Center BUT DO NOT INDICATE AN EXCUSED ABSENCE.

Religious observance

Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Extracurricular activities

Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

Disability Accommodations

Students needing academic accommodations for a disability must first be registered with Disability Accommodations & Success Strategies (DASS) to verify the disability and to establish eligibility for accommodations. Students may call 214-768-1470 or visit <http://www.smu.edu/alec/dass.asp> to begin the process. Once registered, students should then schedule an appointment with the professor to make appropriate arrangements.

Syllabus

Note: due dates and problems will be updated throughout the semester

Chapter	Topic	Warm-up due date	WileyPLUS due date	Manually graded problem
	Introduction			
21	Electric charge	8/28	8/30	P21.11
22	Electric fields	9/4	9/6	P22.26
23	Gauss law (part)	N/A	N/A	
24	Electric potential	9/11	9/13	Either P24.7 or 24.17
Test 1 -- Thursday, September 13				
25	Capacitance	9/18	9/20	P25.37
26	Current and resistance	9/25	9/27	P26.34
27	Direct current circuits	10/2	10/4	P27.44
28	Magnetic fields	10/9	10/11	P28.29
No class: Fall break, Tuesday, October 16				
Test 2 - Thursday, October 18				
29	Magnetic fields due to currents	10/23	10/25	P29.53
30	Induction and inductance	10/30	11/1	P30.34 (in class on 4/9)
31	EM oscillations and alternating current	11/06 (warm-up 10)	11/8	P31.21
32, 33	Maxwell's equations; magnetism of matter; EM waves	11/13 (warm-up 11)	11/15	P31.41 and 33.53 (both are easy problems).
34	Images	11/20 (warm-up 12)	Waived	
Thanksgiving holiday - Thursday, November 22				
35/36	Interference and diffraction	11/27		
Test 3 -- Monday, December 10, 8-11am				