Physics 202/202P

Syllabus

Spring 1999

AN INTRODUCTION TO ELECTRICITY & MAGNETISM

Instructors:

A. Professor Nitin Samarth (Principal course administrator & lab/recitation co-ordinator)
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   - Office hours: Mon 1.00 – 2.00 pm; Fri 1.00 – 2.30 pm or by appointment

B. Professor Moses Chan (Principal lecturer)
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   - Office hours: Tues 12.45 - 2.00 pm; Thurs 12.45 - 2.00 pm

Please note that -- due to the large enrollment in this course -- your principal point of contact for course difficulties should be your recitation and/or lab instructor who will refer you to the course administrator if necessary. When contacting the course administrator by e-mail, please include the phrase "Phys202" on the subject line of the message. Your patience is requested with e-mail correspondence: with a course this large, it may not be possible to reply to all messages in a timely manner!

Course requirements:

- Concurrent registration in both Physics 202 and Physics 202P

Important notes:
- If you decide to late drop Phys 202, you will also be required to drop Phys 202P;
- If you late dropped the course in an earlier semester and obtained permission to complete the Physics 202P for future credit under the earlier policy, please see the course administrator immediately.

- Lab supplies (needed for both pre-lab and lab activities):
  - Desktop Experimental kit (available from campus bookstore). Note that you do not have to get the additional equipment mentioned on the cover of the kit; this will be supplied in the lab.
  - Lab worksheets: these are available in installments from campus and other bookstores or may be downloaded from the course web site.

Important note: The course assumes a thorough familiarity with the basic principles of classical mechanics (Phys 201) and with the mathematical skills learnt in Phys 201 and Math 140 (calculus and vector analysis). It is vital that you review these as early as possible in the semester. A helpful math primer is available for download on the web page.
Course description

Note: Detailed information about the class is posted on the Web at http://www.courses.psu.edu/phys/phys202_nxs16/sp99. Please consult this web site REGULARLY for updates about assigned homework, reading assignments, lectures, recitations, labs, exams, etc.

Physics 202 is a 4 credit course aimed at helping you to actively explore and discover the fundamentals of electricity and magnetism. Several components in this course are used to implement this philosophy:

- **Lectures:** A careful reading of the assigned text forms the foundation of your learning. Hence, it will be assumed that you have completed every reading assignment prior to every lecture. The aim of the lectures will be build upon the concepts that you read about by showing how to apply the concepts to the theoretical analysis of problems and also to experimental demonstrations.

- **Recitations:** The recitations should be viewed as discussion sessions in which your difficulties are clarified and where concepts covered in the assigned homework are discussed. Note that complete solutions to the homework will be posted on the web site shortly after the assignment due date. There is rarely enough time for recitation instructors to discuss all the assigned homework. Instructors will focus on a few central concepts using whatever pedagogic techniques that best suit their personal styles. The assigned homework will be collected and graded. Recitation activities will also include quizzes (and other forms of classwork) directly based on the assigned homework.

- **Laboratory Sessions:** The lab sessions are designed as collaborative group activities that aim to arouse your curiosity about physical phenomena through a variety of learning tools such as:
  - Hands-on experimental activities;
  - Analytical problem solving;
  - Numerical data analysis;
  - Computer simulations.

Each lab group has access to a Windows NT workstation with both specialized Physics software as well as standard word processing and data analysis and presentation software such as Microsoft Office. Familiarity with these programs is not a prerequisite for the course. The lab grade will be based on lab reports and on lab quizzes. For more details, please consult the web page.

Grade policy

Your course grade will be determined out of a maximum of 100 points on the following basis:

- Two mid-semester exams (20 points each) and a comprehensive final exam (25 points): i.e. exams constitute 65% of the total grade;
- Recitation grade: 20 points;
- Lab grade: 15 points.

The following absolute grading scale provides guidelines for the determination of final grades; this grading scale will help you gauge your performance during the semester; note that meeting the minimum scale shown below guarantees the designated grade; however, the scale may be adjusted slightly downwards at the instructors’ discretion depending on the final grade distribution; cut-off points for the fine scale (i.e. A-, B+, etc.) will be decided at the instructors’ discretion at the end of the semester.

- **Above 85:** A
- **70 - 84:** B
- **56 - 69:** C
- **50 - 55:** D
- **Below 50:** F
Conflict Exams and Make-up policy:

- Mid-term exams are held in the evening. Two conflict exam times will be provided for legitimate and documented emergencies and university-mandated obligations.
- There are **no make-up sessions for recitation and lab activities**. If you have missed a recitation or lab because of a valid excuse, please make sure that your recitation/lab instructor receives **written documentation** for your absence so that you do not receive a 0 for that day’s quiz and activity. Missing a quiz or activity for a valid excuse will mean that the relevant quiz/activity report is ignored in your final average.

Course Schedule & Assignments:

- A detailed course schedule, listing reading, homework and lab assignments may be found at the course website. Please consult this regularly.
- Note that for the purposes of recitations and lectures, the “week” begins with the Tuesday lecture and ends with the recitation on Friday/Monday. Homework assigned in a particular week is due during the Friday/Monday recitation at the end of the week.
- Please note that the labs run on a **normal** (Monday-Friday) weekly schedule and will usually involve concepts that were studied during the preceding lecture/recitation week.
- **Important notes about homework:**
  - You are advised to start some of the HW problems after the Tuesday lecture. This applies particularly to students attending Friday recitations, since there is only one evening between the Thursday lecture and the recitation.
  - The HW assignments contain both “questions” and “problems.” To help you with the HW, all the **FINAL answers** are posted on the web in advance. Hence your HW solutions should clearly explain **how you arrive at your answer**. This also applies to the “questions” which usually require non-numerical solutions (for instance, ranking something by magnitude).
# HW Assignments

Reminder: for recitations/lectures, each “week” begins on Tuesday and ends on the following Monday. The HW is due during the Friday/Monday recitation at the end of the relevant “week.”

| HW 1: (1/12-1/18) | Chapter 22 | Questions: 2, 3, 4, 6, 11, 13, 17  
|                   |            | Problems: 7, 10, 16, 19, 20, 36. |
| HW 2: (1/19-1/25) | Chapter 23 | Questions: 1, 2, 8, 10, 11.  
|                   |            | Problems: 1, 12, 19, 32, 34, 57, 60. |
| HW 3: (1/26-2/1)  | Chapter 24 | Questions: 3, 4, 9, 12, 15  
|                   |            | Problems: 4, 10, 15, 27, 32, 53. |
| HW 4: (2/2-2/8)   | Chapter 25 | Questions: 1, 5, 7, 8, 12.  
|                   |            | Problems: 6, 10, 28, 35, 44, 53 |
| HW 5: (2/9-2/15)  | Chapter 26 | Questions: 1, 2, 3.  
|                   |            | Problems: 2, 6, 8, 9, 10. |
| HW 6: (2/16-2/22) | Chapter 26 | Questions: 4, 6, 8, 13.  
|                   |            | Problems: 15, 26, 30, 46, 56, 59, 68. |
| HW 7: (2/23-3/1)  | Chapter 27 | Questions: 2, 3, 4, 12, 13.  
|                   |            | Problems: 5, 15, 27, 41, 52, 55. |
| HW 8: (3/2-3/6)   | Chapter 28 | Questions: 2, 4, 6, 8, 10.  
|                   |            | Problems: 2, 8, 10, 31, 32, 38, 48. |
|                   |            | [3/8-3/12: Spring Break] |
|                   |            | Problems: 66, 70, 71, 74, 76. |
|                   |            | Problems: 6, 8, 20, 46, 49, 55, 63 |
| HW 11: (3/30-4/5) | Chapter 30 | Questions: 1, 3, 5, 8, 10, 14, 15.  
|                   |            | Problems: 8, 13, 18, 32, 43, 60, 67 |
| HW 12: (4/6-4/12) | Chapter 31 | Questions: 2, 3, 4, 6, 8.  
|                   |            | Problems: 4, 6, 10, 29, 38, 41, 43. |
|                   |            | Problems: 45, 52, 55, 70, 77. |
| HW 14: (4/20-4/26)| Chapter 33 | Questions: 1, 3, 4, 5, 6, 7.  
|                   |            | Problems: 6, 7, 9, 18, 34, 38 |
| HW 15: (4/27-4/30)| Chapter 33 | Questions: 8, 9, 12, 14, 16.  
|                   |            | Problems: 56, 60, 62, 76, 85. |