

# Syllabus

**Physics 270**

**Spring 2005**

**Prof. H. H. Chen**

**Lectures:** Sections 0401 M 7:00 – 8:50PM, W 7:00 – 7:50PM in Physics Rm 1410.  
Sections 0402 M 7:00 – 8:50PM, W 7:00 – 7:50PM in Physics Rm 1410.

**Recitations:** Section 0401: W 8:00 - 8:50 PM, in Math B0427.  
Section 0402: W6:00 - 6:50 PM, Room 4220 in Physics Building

**Office:** Physics 3102

**Phone:** 405-6088, hsinghenchen@yahoo.com

**Office Hours:** To be announced

**Teaching Assistants:** Daniel Chapman, Ryan Behunin

**Prerequisites:** Physics 260, 261, I also expect you to be proficient in differential and integral calculus as well as vector algebra.

**Co-requisite:** Physics 271

**Textbook:** Physics for Scientists and Engineers, Volume II, Fifth Edition, by Raymond Serway and Robert Beichner.

## Important Dates – Spring 2006

|                        |   |
|------------------------|---|
| First day of class     | January 25, Wednesday                     |
| Mid term #1            | February 20, Monday                       |
| Midterm #2             | March 27, Monday                          |
| Midterm #3             | April 24, Monday                          |
| Last day of this class | May 10, Wednesday                         |
| Final Exam             | May 15, Monday, 7:00 – 9:00 PM, Phys 1410 |

## Grading

|           |          |
|-----------|----------|
| Homework  | 20%      |
| Lab (271) | 25%      |
| Midterms  | 10% each |
| Final     | 25%      |

**Reading Assignments:** You should read the text for sections listed in the schedule before coming to the lectures and recitations. Materials in the textbook not fully covered in the class should also be read. All sections listed in the schedule may appear in the exams.

**Homework Assignments:** Every Wednesday a set of homework will be assigned to you. They are due a week later. No credit will be given to late homework unless for a good reason. Since doing homework is the only way to truly learn physics, I strongly urge you to take them seriously. You may form groups to discuss homework problems together. But you should not copy homework from each other. If you do not do homework you will fail the class for certain. You should write neatly and have the physical reasoning of the problem clearly explained.

**Exams:** Exams are designed to test your understanding of the materials taught, discussed and assigned to you. You are supposed to memorize certain important facts, including definitions, formulas, principles, laws and theorems. The exam will be closed book. You may bring

calculators but no crib sheets. No makeup exams will be given to students for any reason other than being seriously ill with a note from your physician before or immediately after the exam.

### Laboratory

Physics 271(previous Physics 263A) is the laboratory part of Physics 270, and meets in room PHYS-3220. This course carries one credit and the grade is folded in with the Physics 270 course grade. You must pass Physics 271 in order to pass the entire course. If you do not pass this part of the course you will be required to repeat the entire course. The labs meet for three hours a week. You are expected to attend each class and will be allowed to make up labs only under exceptional circumstances. For more information on the laboratory portion of this course, consult the course web page, or contact Dr. Jawahery. If you have already taken Physics 271(previous Physics 263A) and want that to count for this semester's course, please show the official grade to the instructor.

### Course Schedule:

This course will cover Chapters 29-41 of Serway & Beichner, Volume II. The tentative schedule is the following:

| Date                 | Exams | Topics                             | Chapters from Serway |
|----------------------|-------|------------------------------------|----------------------|
| Wk 1<br>1/25         |       | Magnetic Force                     | 29                   |
| Wk 2<br>1/30         |       | Magnetic Fields<br>Biot Savart Law | 29, 30               |
| Wk 3<br>2/6          |       | Gauss Law<br>Ampere's Law          | 30                   |
| Wk 4<br>2/13         |       | Faraday's Law                      | 31                   |
| Wk 5<br>2/20<br>2/22 | Exam  | Midterm 1<br>Inductance            | Ch.29 - 31<br>32     |
| Wk 6<br>2/27         |       | Alternating Current                | 33                   |
| Wk 7<br>3/6          |       | Electromagnetic Wave               | 34                   |
| Wk 8<br>3/13         |       | Nature of Light                    | 35                   |
| Wk 9                 |       |                                    |                      |

|       |      |                            |              |
|-------|------|----------------------------|--------------|
| 3/20  |      | Spring Break               |              |
| Wk 10 |      |                            |              |
| 3/27  | Exam | Midterm 2                  | Ch 32 – 35   |
| 3/29  |      | Geometric Optics           | 36           |
| Wk 10 |      |                            |              |
| 4/3   |      | Interference               | 37           |
| Wk 11 |      |                            |              |
| 4/10  |      | Diffraction & Polarization | 38           |
| Wk 12 |      |                            |              |
| 4/17  |      | Relativity                 | 39           |
| Wk 13 |      |                            |              |
| 4/24  | Exam | Midterm 3                  | Ch 36 – 39   |
| 4/26  |      | Quantum Mechanics          | 40           |
| Wk 14 |      |                            |              |
| 5/1   |      | Quantum Mechanics          | 41           |
| Wk 15 |      |                            |              |
| 5/8   |      | Review                     |              |
| 5/15  | Exam | Final Exam                 | All Chapters |

### Homework Assignments (Tentative)

| Week number | Homework number | Homework Due Date | Problems                                     |
|-------------|-----------------|-------------------|--|
| 1           |                 | --                |  |
| 2           | 1               | 2/6               | Chap 29: 4, 12, 14, 23, 31, 39, 44; 48, 68   |
| 3           | 2               | 2/13              | Chap 30: 3, 4, 16, 19, 30, 31, 34, 36, 40    |
| 4           | 3               | 2/20              | Chap 31: 2, 4, 17, 22, 26, 32, 36, 37, 44    |
| 5           | 4               | 2/27              | Chap 32: 4, 11, 14, 16, 24, 31, 36, 42, 52   |
| 6           | 5               | 3/6               | Chap 33: 2, 6, 9, 16, 18, 20, 24, 30, 38     |
| 7           | 6               | 3/13              | Chap 34: 3, 4, 7, 11, 13, 30, 31, 43; 58     |
| 8           | 7               | 3/20              | Spring Recess                                |
| 9           | 7               | 3/27              | Chap 35: 2, 3, 5, 13, 16, 27, 31, 38, 39; 43 |
| 10          | 8               | 4/3               | Chap 36: 2, 12, 23, 25, 33; 41, 45           |
| 11          | 9               | 4/10              | Chap 37: 1, 7, 9, 14, 17, 21, 26, 31, 44     |
| 12          | 10              | 4/17              | Chap 38: 1, 8, 14, 17, 23, 31, 36, 38, 52    |
| 13          | 11              | 4/24              | Chap 39: 2, 3, 6, 13, 17, 26, 31, 35, 41, 49 |
| 14          | 12              | 5/1               | Chap 40: 7, 9, 15, 18, 20, 31, 38, 42, 56    |
| 15          | 13              | 5/8               | Chap 41: 3, 11, 14, 15, 17, 21, 26, 31       |
|             |                 |                   |  |