Syllabus

Course: P209B_001  Tuesday 2 – 4:50 pm  Darwin Hall 311
Instructor: Dr. So Young Han, hanso@sonoma.edu, www.sonoma.edu/users/h/hanso/
Office Hours: Thursday 2-4 pm Darwin 300B, Tel.:664-3242

Course Description: The laboratory component of the algebra based physics P210B. It covers electricity and magnetism, waves and optics.
GE: Category B1 or B3 and GE laboratory requirements.
Prerequisite: P210B, Trigonometry and algebra

University Policies
There are important University policies that you should be aware of, such as the add/drop policy; cheating and plagiarism policy, grade appeal procedures; accommodations for students with disabilities and the diversity vision statement. http://www.sonoma.edu/uaffairs/policies/studentinfo.shtml

Accommodations for Students with Disabilities
If you need disability related accommodations for this class, such as a note taker, test taking services, special furniture, use of service animal, etc., please contact the office of Disabled Student Services (DSS) located in Salazar Hall, Room 1049, Tel: 664-2677

Objective:

1. Reinforce physics concepts learned from lectures with hand-on experiments.
2. Prepare future experimental physicist
3. Practice leadership and cooperative working skills.

What do we expect from a quality experimental physicist?  
Is not simply following prepared procedures
A critical thinker/ adjuster/ fixer
Questioner/ Evaluator

From above reasons, followings are expected in this lab

1. Your goal is not to blindly follow lab procedures, generate preliminary results, and leave.
2. You are the main operator in this lab. You need to know what you are doing in each step of your action.
3. Always try to obtain the best. Don’t be satisfied with a proper/expected result. Think about how you can make it better.
4. The group with the best results (fast) will be rewarded bonus points.
5. When you obtain data from your measurement (sometimes with large errors), think about what this result means and why you have these errors in your measurements. If you can obtain logical scientific reasoning for your errors/and results, you will be also rewarded bonus points.
6. Your laboratory manual and instructor would act only as your guides. The given procedure on the manual is only an outline and you are encouraged to upgrade/ modify with proper reasons.
Materials to bring: Lab worksheet (Download it each week from www.sonoma.edu/users/h/hanso)
Pre-lab report (Download it and finish it before labs), Calculator
Scantron for the daily quizzes, Three-ring binder (½ inch) for all returned work.

Attendance: Attendance is mandatory. You can make up only one lab at the end of the semester. ½ point deduction from lab scores for every 15 late minutes. It is your responsibility to check in late.

Grade:
- Pre-Lab report 10%
- Lab worksheet (one per group) 20%
- Daily quiz 20%
- Individual Lab Report 50%

A [93 above, A- [92-89], B+ [88-86], B [85-83], B- [82-79], C+ [78-76], C [75-73], C- [72-69], D [68-60], F [Below 60]

Lab Procedures

Lab Introductory Lecture
← Turn in pre-lab report
← Check Attendance

Instruments Set up and Measurements

Short Calculation, Measurement
← Daily Quiz
← Turn in Lab worksheet

Data Analysis and Evaluations

Discussion and Developing Concepts
← Individual lab report Due 1 week after the lab

*Grades are based on an absolute scale, not a curve. To pass you cannot miss more than 3 labs.
* Quiz
You will have a quiz at the end of the lab. The daily quiz covers pre-lab report, lab introductory lectures, and lab procedures. You cannot make up a missed quiz. Your lowest quiz (or one missed quiz) will be dropped.
* Lab worksheet
Down load and print the lab worksheet from www.sonoma.edu/users/h/hanso before the lab. Complete the worksheet at least 15 minute before the lab ends. Turn one lab worksheet per group before you leave. (Don’t forget to write your name on it.)
* Individual lab report
You have one week to complete a formal individual lab report. You may submit a late report no later than 1 week after the due. You will have 10% grade reduction for late lab report and pre-lab report. Your lab report should not be more than 3 pages.
Individual Lab Report Format

Title: 
Date: 
Group Name: 
Name: 
Partners: 

Purpose:
Short abstract and objective of the lab. (~1-2 sentences)

Concepts:
Describe concepts and theory used in the lab. What is the physics behind the lab? Include all physics equations and constants used. (~1-2 paragraphs)

Equipment and Setup:
List of all equipments used
A block diagram of the instrument set up with labels

Procedures:
1. Describe each step and number steps.

Data analysis:
Show your raw data measured.
All data should be labeled and should have proper units.
Show all calculation and works. (Ex) 2.0 x 3.0 = 6.0
Present raw data and calculated values neatly using available tools such as tables and graphs.

Discussion and Conclusion:
Compare your data with theory.
Evaluate your data.
What is a possible source of error? How can you improve your measurement? (Be specific and explain. ‘human error’ or ‘being careful” is not good enough.)

Do your part:
What was your role in the group. (Write down what you did physically in the lab.)

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Tentative Schedule

| W1 | (Feb 2) | Introduction |
| W2 | (Feb 9) | LAB1. Simple Harmonic Motion and Data Studio |
| W3 | (Feb 16) | LAB2. Waves I |
| W4 | (Feb 23) | LAB3. DC Circuits |
| W5 | (Mar 2) | LAB4. RC Circuits |
| W6 | (Mar 9) | LAB5. Magnetic Field of a Solenoid |
| W7 | (Mar 16) | LAB6. Magnetic Field of Helmholtz Coils |
| W8 | (Mar 23) | LAB7. Properties of Light |
| W9 | (Mar 30) | LAB8. Thin Lenses |
| W10 | (Apr 6) | Spring Break |
| W11 | (Apr 13) | Furlough; No Lab |
| W12 | (Apr 20) | LAB9. Polarization |
| W13 | (Apr 27) | Furlough; No Lab |
| W14 | (May 4) | LAB10. Diffraction |
| W15 | (May 11) | LAB11. Optics Show (No Lab Report) |
| W16 | (May 18) | LAB12. Make Up Lab |