Syllabus

Course: P209B_001 Monday 1 – 3:40 pm Darwin Hall 311

Instructor: Dr. So Young Han, hanso@sonoma.edu, www.sonoma.edu/users/h/hanso/

Office Hours: Monday 11:40-12:40, Thursday 1:40-2:40 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 scientist.
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 are only for your guidance. 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 (From the instructor at the beginning of each lab.)
Pre-lab report (The completed work will be collected at the beginning of each lab.),
Lab Manual for guidance (Can be purchased in the lab.)
Lab Notebook with permanent binding
Calculator and a memory stick, Scantron for the daily quizzes

Attendance: Attendance is mandatory. You can make up only one lab at the end of the semester.
3 point will be deducted from the lab worksheet score for students showing up late (15 minute or more). It is your responsibility to check for late attendance.

Grade: Pre- Lab report 10%
Lab worksheet (one per group) 30%
Daily quiz 20%
Individual Lab Report 30%
Lab Note 10% (0, S, U)
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 Reports

Instrument Set up and Measurements

Short Calculation, Measurement ← Turn in Worksheet

Data Analysis and Evaluations ← Turn in Lab Note

Discussion and Developing Concepts ← Take a Quiz

*Grades are based on an absolute scale, not a curve. To pass you cannot miss more than 3 labs.

* Quiz
We will have a quiz at the end of each lab. The daily quiz covers pre-lab report, lab introductory lectures, and lab procedures. You cannot make up a missed quiz. Your lowest quiz score (or one missed quiz) will be dropped.

* Lab worksheet
You may get the lab worksheet from the instructor at the beginning of each lab. Complete the worksheet at least 15 minute before the lab ends.
Turn in one lab worksheet per group before you take a quiz. (Don't forget to write your name.)

* Individual lab report
You need to complete 3 formal individual lab reports this semester. You may submit a late report no later than 1 week after the due. You will have 10% grade deduction for late lab reports and pre-lab reports. Your lab report should be more than 2 pages.

* Lab Note
Keep all information (raw data, calculation, thoughts and discussions…) on the lab note.
[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. Use complete sentences. A list of topics (or bulleted topics) is not good enough. (~1/2 of page)                      

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

Procedures:                1. Describe each step of experiments.                      
                                2. Number each step.                      

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.)                      
                                This part should be at least ½ of page long.                      

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lab Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>Jan 31</td>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>W2</td>
<td>Feb 7</td>
<td>Lab 1. EXCEL and Data Studio</td>
<td></td>
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<tr>
<td>W3</td>
<td>Feb 14</td>
<td>Lab 2. Waves1; SHM</td>
<td></td>
</tr>
<tr>
<td>W4</td>
<td>Feb 21</td>
<td>Lab 3. Waves2; Speed of Sound (Individual Report1)</td>
<td>Report 1 Due</td>
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<tr>
<td>W5</td>
<td>Feb 28</td>
<td>Lab 4. Static Electricity</td>
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</tr>
<tr>
<td>W6</td>
<td>Mar 7</td>
<td>Lab 5. DC Circuits</td>
<td>(Individual Report2)</td>
</tr>
<tr>
<td>W7</td>
<td>Mar 14</td>
<td>Lab 6. RC Circuits</td>
<td>Report 2 Due</td>
</tr>
<tr>
<td>W8</td>
<td>Mar 21</td>
<td>Lab 7. Magnetic Field of a Solenoid</td>
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<tr>
<td>W9</td>
<td>Mar 28</td>
<td>Lab 8. Magnetic Field of Helmholtz Coils</td>
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<tr>
<td>W10</td>
<td>Apr  4</td>
<td>Lab 9. Geometric Optics (Individual Report3)</td>
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<tr>
<td>W11</td>
<td>Apr 11</td>
<td>Lab10. Thin Lenses</td>
<td>Report 3 Due</td>
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<tr>
<td>W12</td>
<td>Apr 18</td>
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<tr>
<td>W13</td>
<td>Apr 25</td>
<td>Lab11. Polarization</td>
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<tr>
<td>W14</td>
<td>May  2</td>
<td>Lab12. Diffraction</td>
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<tr>
<td>W15</td>
<td>May  9</td>
<td>Lab13. Optics Show</td>
<td></td>
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<tr>
<td>W16</td>
<td>May 16</td>
<td>Lab14. Make up</td>
<td></td>
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Spring Break