

# Syllabus for PHYS 313

## Intermediate (Junior) Laboratory

PS 133, Time TBA

PHYS 313 (139970) - Junior Laboratory. Prerequisites: PHYS 211/212, PHYS 213/214.

INSTRUCTOR: Mr. Martin Hackworth (Martin), Senior Lecturer & Lab Supervisor

OFFICE: PS 117B

PHONE: 282-4439 (Pocatello)

Web Site: <http://www.physics.isu.edu/~hackmart/phys313.htm>

**MATERIALS:** An Introduction to Error Analysis, by John R. Taylor, Lab notebook (Roaring Spring® Brand Computational Notebook, #77-648), Microcal Origin® software (provided by the department), access to word processing and spreadsheet software, access to the world wide web.

**OBJECTIVES:** To acquaint students with intermediate laboratory techniques, self-sufficiency, and an environment where the answers to the odd-numbered problems are not in the back of the book. To introduce students to proper techniques in experimental measurements and statistical analysis. To measure fundamental constants.

### COURSE REQUIREMENTS:

1. Complete five experiments.
2. Develop one short paper on experimental statistics.
2. Keep a detailed laboratory notebook.
3. Complete a formal laboratory report for each experiment.

**GRADING:** Your grade will be computed from the following sources:

- Graded lab reports - 40%
- Paper - 10%
- Lab notebook - 30%
- Final Exam/Project - 20%

### LABORATORY NOTEBOOK AND REPORTS

Your lab notebook should consist of  $11\frac{3}{4} \times 9\frac{1}{4}$ ,  $4 \times 4$  quad engineering paper without carbons, with numbered pages, in a permanent binding (Roaring Spring® Brand Computational Notebook, #77-648). Space should be reserved on the first three pages for an index.

A lab notebook is a journal of what you do in this lab. Your lab notebook is to be used only for this course. You are to write your observations and measurements in a legible manner, in ink, directly into your lab notebook without recopying. Mistakes in an experiment are part of the game. You should never erase or recopy lab notes, or tear pages out of your lab notebook, or make an entry in your lab notebook prior to beginning an experiment. All of the material in your lab notebook should be original (i.e., no photocopies, paste-ups, etc., or copying directly from anywhere else) and should pertain directly to what you have done in each experiment. You are not permitted to use anyone else's lab notebook in preparing your own.

LAB FINAL - A comprehensive lab final is given at the end of the semester. The lab final covers all of the physical concepts covered in the lab and is therefore somewhat involved. At the discretion of the instructor, a final project may be substituted for the final exam.

### Lab Reports

Unless otherwise instructed, all lab reports should consist of the following, each section beginning on a new page:

#### Title page

- Name
- Partner's name
- Title of experiment
- Date due/date performed

#### Abstract (very short - 1 or two paragraphs)

- Purpose and brief general description of the experiment

#### Theory section

- Physics theory must be relevant, but no need to completely reinvent the wheel.

#### Procedure

- Tell what you did, not what someone else did or suggested, and why.
- Include sketch/schematics where necessary

#### Data tables and graphs

- Neat and complete

#### Sample calculations

- Must be neatly done
- Sufficient to follow your work
- Show propagation of error

#### Discussion of errors

- Must be realistic
- Give % error

#### Results and conclusions

- Did you measure what you set out to measure within reasonable accuracy? Why or why not?

Avoid plagiarism. Include a reference page if necessary. If you are unsure of what constitutes plagiarism I suggest that you look it up in your student handbook and/or contact me. Any clear style of writing that is grammatically correct is acceptable but the style should be formal and professional.