

Physics 2211 – IPLS flavor

Recitation and labs

This “lab” section serves to

1. Spot check that you are keeping up with the material (Quizzes)
 - Almost weekly. First 25 minutes of section. Worth 5 / 20 points. Refers to past week’s lecture material
2. Give you guided practice solving problems (Recitation)
 - Weekly. Approximately 40 minutes. Refers to current lecture material.
3. Expose you to real physical systems (Labs)
 - Multi-week experiments. Pacing may diverge from lecture but hopefully not precede it. Worth 15 / 20 points.

Personnel



Jennifer Curtis
Lectures
General course high
muckety-muck



Nicholas Darnton
Lab coordinator



Curtis Balusek
Teaching Assistant



Hema Selvakumar
Teaching Assistant

Our Labs

Many of our labs will be more open-ended than you are used to, and less prescriptive than in the other intro physics courses.

You will decide

1. What question to answer
2. How to and how much data to gather to answer your question
3. How to present your data to communicate your conclusion.

Lab report

The lab report contains three sections:

Journal

This corresponds roughly to Materials and Methods in a scientific paper. A description of what you did, detailed enough that a third party could reconstruct (or replicate) your experiments.

Data and Interpretation

Your findings, displayed in an easy-to-understand form, with the important features explicitly described and explained.

Evaluation

Deeper reflection on what your results mean. Do they make sense? Are they consistent with other things you know? How could the lab have been improved?

Teams

Lab teams will be composed of 3-4 randomly chosen people.

Team composition is fixed for the semester.

We hope you will like each other. Whether you do or don't, you must treat each other politely and respectfully. This is good practice for your future work life.

Roles within the team rotate from lab to lab:

Journalist

Takes notes of everything that happens during the experiment. Writes the “Journal” section of the lab report.

Data Interpreter

Tabulates and displays data, operates the computer. Writes the “Data and Interpretation” section of the lab report.

Critic

Performs outside research (if required), and thinks critically about the structure of the experiment. Writes the “Evaluation” section of the lab report.

Checker

Checks all sections of the lab report for legibility and consistency. Acts as a project manager for the lab. In a group of three, the role of checker is shared by all group members.

Grading

Quizzes will be graded and reported separately from labs.

Total quiz score will be scaled to a maximum of 5 of the 20 lab points.

Each lab report will be graded according to a rubric

Completeness (1-3)

Are all the parts of the lab completed? Have you answered any specific questions we asked of you?

Omitting something would negatively affect this score.

Clarity (1-5)

Can we understand what you did and what you observed?

Poor writing and poor visual presentation would negatively affect this score.

Persuasiveness (1-5)

Have you convinced us?

Mistakes in the physics, under-explaining, or over-hyping would negatively affect this.

Inspiration (1-3)

An opportunity for us to give you credit for tackling a difficult question rather than taking it easy.

Personal contribution (1-3)

Did you (personally) do the lion's share of the work, or were you texting the whole time?

Total lab report scores will be scaled to 12 / 20 lab points.

Pre-lab readiness assessments

We will frequently quiz you (lightly) on pre-lab reading or lab concepts. These readiness assessments will be administered through WebAssign and will count for 3 / 20 lab points.

Computers and computer programs

Video acquisition

Phone, OS, webcam software, or AmscopeX (proprietary to our microscope)

Video transcoding

OS, VLC, online services or Adobe Premiere

Extracting data from video

ImageJ (aka Fiji)

Mathematical manipulation of data

Excel, MATLAB or python.

Graphical representation of data

Excel (barely), MATLAB or python.

Report preparation

Word or Word clone, or a real typesetting language (LaTeX)

I highly encourage you to bring your own computer with these tools installed and ready to use.

Lab computers are sluggish, cannot be configured, and **delete data frequently**.

For next week

Do the pre-lab reading and readiness assessment quiz

Will be posted on WebAssign asap.

Bring your laptop, with functioning software for

1. Mathematical manipulation of data
 - Excel, MATLAB, ...
2. Graphical display of data
 - Excel, MATLAB, ...
3. Presentation and publication of data to PDF format
 - Word, Google docs, ...