

Semester Calendar

The notation “1-1” indicates the first experiment of the semester, and the first week of three weeks spent on that experiment. “3-2” means the third experiment of the semester, and the second of three weeks spent on that experiment.

Meeting	Week	Thursday	Friday
1	Mon, Jan 20 to Fri, Jan 24	1-1	1-1
2	Mon, Jan 27 to Fri, Jan 31	1-2	1-2
3	Mon, Feb 3 to Fri, Feb 7	1-3	1-3
4	Mon, Feb 10 to Fri, Feb 14	2-1	2-1
5	Mon, Feb 17 to Fri, Feb 21	2-2	2-2
6	Mon, Feb 24 to Fri, Feb 28	2-3	2-3
7	Mon, Mar 2 to Fri, Mar 6	3-1	3-1
8	Mon, Mar 9 to Fri, Mar 13	3-2	3-2
9	Mon, Mar 16 to Fri, Mar 20	Spring Break	
10	Mon, Mar 23 to Fri, Mar 27	3-3	3-3*
11	Mon, Mar 30 to Fri, Apr 3	TR-1	TR-1
12	Mon, Apr 6 to Fri, Apr 10	TR-2	TR-2
13	Mon, Apr 13 to Fri, Apr 17	TR-3	TR-3
14	Mon, Apr 20 to Fri, Apr 24	TR-4	TR-4
15	Mon, Apr 27 to Fri, May 1	Reports due	

* Because this meeting would occur on a school holiday (César Chávez Day), this meeting should be rescheduled individually with Prof. Lyzenga.

Caution

Summary reports are due **before noon two days before the first lab meeting for the next experiment**. Please aim to have the work submitted on time. To handle unavoidable time crunches, you will start with a bank of 5 late days, which can be used at any point during the semester without penalty. Once the bank is exhausted, your grade will be reduced for each day your report is late.

The 60-minute final exam will be given on Friday, May 8 at 1:30 PM.

Introduction

This laboratory/lecture course is designed to

1. reinforce and extend your skills in designing an experiment to test a hypothesis, and to fine-tune your expertise in rigorously analyzing the results of your measurements to determine if the hypothesis has been disproved or supported by your experimental studies;
2. extend your knowledge of theoretical optics and introduce new experimental techniques in optics;
3. engage you in performing interesting and challenging experiments in optics, pique your interest in experimental physics, and inspire you to pursue a career in science.

The course consists of 3 laboratory experiments, one technical report project, and roughly 20 lectures with two associated problem sets. There is also a 60-minute final exam. The experiments are to be chosen from eight possible experiments that are currently set up in the laboratory. The lectures will be given during the first half of the semester, at 10:00 on Monday, Wednesday, and Friday in of each week Shanahan 3465. **The first lab meeting will be a working session!** It is important that you read the lab manual and indicate to your instructor by email which experiment you would like to perform first.

A schedule of lab meetings appears on page ii. Three laboratory meetings are allotted for each of the experiments. The lab instructions leave a good deal of room for your own creativity, so you will need to think carefully about each experiment **before** coming to lab. References are given in the laboratory instructions to background reading material which can be found in the main laboratory, Jacobs B121. You are encouraged to browse through the books and read them in the lab, but **please do not remove these books from the lab!** If you photocopy the sections or chapters of interest, we can all share the books harmoniously.

Time in the laboratory will be tight unless you arrive well prepared. To encourage you to do this, we are requiring **reading logs**. That is, by noon of the day of the first lab meeting for each experiment, you must send your instructors an email message demonstrating that you understand the main point of the experiment. In addition, you should include any questions that have already occurred to you. At the discretion of your instructor, there may be additional reading logs required for later days in the experiment.

Laboratory notebooks are an important part of this lab course and will be primarily a diary of what you do in the laboratory; they should also include an informal summary of results, data analysis, and conclusions at the end of each week's work. At the end of each experiment, a formal summary with data plots, measured values with uncertainties, and any final insights should be integrated into a \LaTeX document ("summary report"). These reports are typically 3–5 pages long in Physical Review format. The source files and a pdf version should be submitted on Sakai. These electronic "summary reports" will be archived and shared with future students who are pursuing topics that overlap with your work. Reports of an experiment are due two days before the first lab meeting of the next experiment, so that you will have time to prepare for the

next experiment. That is, the Thursday section will submit reports on Tuesday before noon, and the Friday section will submit them on Wednesday before noon; see the calendar on page ii. A sample report is posted on Sakai.

There will be a multiple choice **final examination** given at the end of the semester. Questions on the exam will cover the material in the lectures, problem sets, and all experiments set up in the laboratory. However, the exam will be graded so that you can obtain a score of 100 even if you choose not to answer the questions pertaining to the experiments that you have not performed.

The grades on the three summary reports, the technical report, and the combined grades in the homework, reading logs, and final exam will be equally weighted (1/5 each) to derive the final grade in the course. **As a general rule, the grade for a late notebook writeup will be reduced based on how late the work is submitted.** Each student starts the semester with a bank of 5 late days. After those are exhausted, penalties accrue. Exceptions will of course be made for illness, natural disasters, or similar unusual circumstances. Please be sure to apprise your instructor of potentially extenuating circumstances.

This course carries two units of academic credit, and hence you should be devoting an **average** of 6 hours/week (absolute maximum average of 8 hours/week) to the course. This figure includes the 3-hour lab session and 1.5 hours of lecture (averaged over the semester) each week. If you find that you must spend more time than this to complete the work to your satisfaction, please notify your instructor. We intend this course to pique your curiosity and provide an outlet for your creativity, not to beat you senseless with a heavy load of required work. If you enjoy this course as much as the instructors do, it will be a high point of your semester.