Version 1.1, circa Aug. 27, 2024

Changes history: v1.1: it's a 3-credit class, lab reports → GradeScope

This interactive syllabus is subject to change as necessary / updated version will be posted on CANVAS.

Wave Motion and Optics Labs and Lectures (Phys1361 and "W" option (Phys1661))

Fall 2024

- Lecture Instructor: dr.s. (Prof. Vlad Savinov, click here, vps3@pitt.edu).
- Contacting dr.s. concerning class matters: best via email.
- Office hours by dr.s.: as necessary, virtual (via ZOOM), also while in the lab (OEH 306).

- Lab Instructor: Dr. Istvan Danko, click here, izdanko@pitt.edu).
- Contacting Dr. Danko concerning lab matters: best via email.

- Lab TA: Ms. Alia Dawood (she will be giving you your lab grades, click here, amd432@pitt.edu).
- HW grader: Mr. Orlando Warren (he will be giving you your HW grades, click here, ojw4@pitt.edu).
- Lectures: WF 1:00pm-1:50pm, Allen Hall 106.
- The textbook: *Optics*, Fifth Edition, by Eugene Hecht, Pearson, 2016.

I will communicate with class using CANVAS and (possibly) via email. All emails sent to class will also be posted/archived on CANVAS. Please make sure to set your CANVAS account to alert you when new announcements are posted. Important information will be posted on CANVAS almost daily.

Super Brief Course Description: all things optics, in the lab and at lectures / 3-credit class.

Attendance

Weekly work in the lab is mandatory. Not doing the labs is the way to fail this class. More about the labs is explained later in this syllabus. Lecture attendance is not mandatory though expected. Students are most strongly advised to take lecture notes. Lectures will NOT be recorded. Lecture notes will NOT be available. Whenever possible, snapshots of my whiteboard will be posted on CANVAS after class.

Textbook

We will be using Fifth Edition of Hecht's Optics, many if not most or even all homework problems will be assigned from this (NON-international) edition. We are going to use only a fairly limited part of the textbook. However, pre-lab reading from this (or any other) edition will be required.

Lectures

Lectures will expose you to a variety of topics (generally and primarily, Optics-related), however, do not expect that they will sufficiently prepare you for your work in the lab. This will be explained further in class. Some reading for class will be regularly assigned on CANVAS.

Labs

Labs are an exceptionally important part of this 3-credit class (50% of your final grade will be determined by your performance in the lab / lab reports)! Some reading for the labs will be regularly assigned on CANVAS.

Before coming to OEH 306 to do the labs, you must prepare a "prelab" and submit it electronically via CANVAS. Prelab is an outline for the lab that demonstrates that you have read and understood the instructions and know what you are going to do in the lab. Prelabs should have a title and contain the main objectives of the experiments you plan to perform, essential theory (though no long derivations), critical formulas (as applicable) and a brief description of the types of data you plan to take/record including "dummy" tables and graphs you plan to prepare. Prelabs have to be turned in via CANVAS before you come to the lab. You will not be allowed to work in the lab until the TA or Dr. Danko approve you to do so after taking a look at your prelab document. Note that doing a good job preparing your prelab would greatly help you get the lab work done in less time than otherwise.

While working in the lab you must take written notes. These notes should contain all measured numbers and descriptions of the procedures used, sketches of setups and whatever information is important to document while you work in the lab. You are allowed to use a lab notebook of your choice (including electronic). Don't forget to take pictures of your setup and remember to add captions / explanations / labels (which you will need later).

Before finishing your work in the lab, you MUST show your lab notes and obtain a signature (which could be an electronic confirmation on CANVAS) from either the TA or Dr. Danko. Do not leave the lab until you get this authorized personnel to sign off on your lab notebook (possibly with some comments)! If you use paper notebook, you must turn in this signature page with your lab report.

You will have to perform 8 "standard" labs (one weekly session each) and two special labs (two weekly sessions each) individually assigned toward the end of the term. You are expected to do labs in pairs or individually (when there are enough benches to do so). Each lab must be done during the assigned week. The schedule of the standard labs will be posted on CANVAS. If you cannot make it on your assigned day, please make an alternative arrangement with Dr. Danko, his decisions are final. While you may be doing a lab (and taking data) with a partner, you must prepare your own prelab, take your own notes and prepare your own lab report. Data analysis will have to be performed using the tools of your choice, e.g., python (as will be explained by Dr. Danko during the first lab session). The week of "fall break" (Oct. 14 through 18) will be reserved for make-up labs (upon **you** coordinating this with Dr. Danko).

Your lab report will have to be submitted as a single PDF file via GradeScope no later than one week following the lab session where you performed the lab. Firm deadlines for lab reports will be enforced. Your original lab report may have a variety of sources of information (some from your prelab, some just snapshots of the experiment, even (literally) pasted printouts of the tables, sketches and such), however, you are required to organize your information well and package it as a single PDF file before submission. Each lab will also include some exercises, you will have to turn these in together with your lab report, appended in the end of your PDF file. Your TA has discretionary power to modify the logistics of turning in the lab reports as and if necessary.

Never stare into the laser beam or shine it in the direction of other students! Be exceptionally careful when redirecting the laser beam with mirrors! Dr. Danko will discuss other safety matters with you at the first lab session.

CANVAS

Up to date information about class, including lab news, assignments and announcements will be regularly posted on CANVAS. You can access CANVAS at http://canvas.pitt.edu (use your Pitt network computer account and password to log in). CANVAS information will be updated regularly. Make sure you check CANVAS for this class often.

Lab Work Grading

We will operate according to the following **guidelines**:

Each of the 8 "standard" labs: up to 50 points total including (approximately):

- 10 points for the prelab,
- 20 points for notes taken during the lab,
- 15 points for data analysis (including tables, graphs, etc and their quality),
- 5 points for exercises (when required).

Each of the 2 special labs: up to 80 points total including:

- 10 points for the prelab,
- 30 points for notes taken during the lab,
- 30 points for data analysis,
- 10 points for exercises (when required).

Therefore, a perfect score for all 10 labs would give you up to 560 points. As explained below, these 560 points will comprise 50% of your total score (used to arrive at your final letter grade) for this class. Note that all four components (prelab, notes, data analysis and exercises) are required to receive any credit. Generally, a full score would require a coherent high-quality lab report. Your credit for special labs will likely depend on your effort, creativity and resourcefulness. Note that data analysis includes "error analysis", i.e., the analysis of uncertainties.

Note that all matters related to the lab, prelabs, your final lab report and your lab grade (points) are between you and the TA who will be helping you in the lab.

Homework Assignments

Homework will be assigned (announced on CANVAS) regularly. You will be turning in your work for each assignment as a single PDF file via GradeScope. Make sure to show all your work. Do not skip intermediate steps. Please try to be neat. Do not turn in your scratch (electronic) paper. Do not email your work to me or the grader (unless your grader or I request this) – use GradeScope. Make it easy for the grader to figure out what you have done. Show ALL steps, do NOT assume that some of the steps are "obvious" or "trivial". Points will be taken off for incomplete explanations and/or difficult-to-follow work. Note that the "official" solutions should not be used as a reference of how much of your work you have to show: these solutions often provide just some guidance, while important calculations and

elaborations are rarely shown. Your own solutions should show all calculations and elaborations. This applies even more so to the exams. It would be best to document your work exceptionally well, with the explanations of what you do and why you do that. **This requirement is of particular importance especially at midterm and final exams.** Homework problem solutions will be posted on CANVAS. All matters related to grading are between you and the grader.

"W" option (Phys1661)

Unless announced separately, there will be no regular Wednesday morning lectures/classes for Phys1661. To satisfy your "W" requirement I will ask you to turn in more-detailed lab reports (including a write-up specified at a later time) for two labs of my choice. If you want my feedback (and a chance to get a better score for the "W" option, you will be suggested to turn in the draft of your detailed lab report a week before the deadlines for individual "W" assignments).

Grading Scheme and Other Details

Your work will be score-graded. Each homework will be 10 points max. Similar scoring will be used for midterm and final exams. As far as I know, final exam is currently scheduled to take place on Friday, Dec. 13, between 8am and 9:50am. Your letter grade will be determined using your total score with contributions from your lab work and reports ($\sim$50%), your homework ($\sim$15%), midterm exam ($\sim$15%), and final exam ($\sim$20%). Correspondence of scores to letter grades will be announced in December after the grades are posted. There will be no for-credit quizzes. There will normally be no extra-credit opportunities, unless I decide to make these available to the entire class. Unless the university transitions to a remote learning mode, there will be NO remote exams. If I get sick and could transmit something harmful to you in class, I may occasionally schedule a remote lecture. If you have any questions / need anything clarified, please contact me via email.

Special and/or Unexpected Circumstances and Emergencies

Should such arise, please follow the following protocol: first take care of your emergency and/or unexpected circumstances and then, when you have time, send me an email outlining your circumstances and the nature of your emergency. All such events will be handled on case-by-case basis. Generally, please do not rely on oral communications with me – any request / explanation of some situation / any commitment must be communicated electronically. Generally, no "I" or "G" grades will be assigned in this class. All work for this course should be completed before the end of this term.

Religious Observances and Class/Lab Activities

In case your religious observances conflict with class/lab activities / tests / homework assignments due dates and such, please alert me, Dr. Danko and the TA to such possible conflicts as soon as possible and in advance.

Special Accommodations for Disability

If you have a disability that requires special testing or other accommodations, you should notify both the instructor and the Office of Disability Resources and Services (DRS) as early as possible in the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. The Office of Disability Resources and Services is located in the William Pitt Union, Room 140. If needed, please call (412) 648-7890 (voice) to schedule an appointment with them. A

comprehensive description of the services provided by DRS office can be obtained on their web site.

Academic Integrity

All students in this course are expected to follow the University of Pittsburgh academic integrity guidelines. If you are not aware of the specifics, you should obtain a copy of these guidelines from the Dietrich School of Arts and Sciences Dean's Office, 140 Thackeray Hall, or look them up online at their web site. Violations of these guidelines by a student may result in a zero score for an examination/homework/lab report etc or/and a failing grade for the entire course.

Other University Policies

Over the past many years Pitt developed a large number of important policies. This syllabus is assumed to be in implicit 100% compliance with all these policies and regulations.