
IU Physics P460

Modern Optics, Spring 2020

Course Information

Course Overview In P460 we will cover: Physical optics and electromagnetic waves based on electromagnetic theory: wave equations; phase and group velocity; dispersion; coherence, interference, diffraction, and polarization of light and of electromagnetic radiation generally; holography; masers and lasers.

Instructor [Rex Tayloe](#)
Swain West 269/MESH 110
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Office Hours:

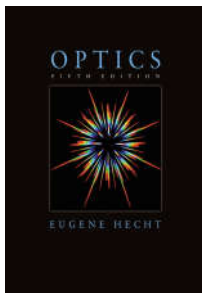
M,W 9:30-11:00a, T: 1:00-2:30p in office (SW269) or in optics lab (SW102) and after class or by appt.

Schedule **Lecture:** MW 11:15A-12:05P in Swain West 102
Lab: T 2:30P-4:25P in Swain West 102

Prerequisites Prerequisites are "P331 or consent of instructor". Ideally you have also taken or are taking P332. Also it is best to first take P309, "Modern Physics Lab". Talk to instructor if you haven't had these courses.

www site This information as well as the syllabus and announcements will be available via the CANVAS page for this course.

Required Materials



- Textbook: [Eugene Hecht, "Optics", Pearson, 5th ed., 2016, \(ISBN-10: 0133977226\)](#)

We will be use this text to guide our studies in optics in this class. Will attempt to get a copy on reserve in the library.

- A logbook, like this ["computation book: from Amazon"](#). Available online or at the IU bookstore. You will use this to record your laboratory investigations. It must be bound, and the pages must be cross-hatched and numbered.

Course Organization

This course meets for two 50-minute lectures and one 2-hour lab each week. Lecture topics, required reading, lab, and homework for each week will be posted on the syllabus. Reading is to be done before the class period where it will be discussed. Homeworks will be due on the date specified on the syllabus (generally wednesdays). There will be two in-class exams. Instead of a final, we will have a final project with writeup and a presentation. The course grade will be based on performance with weightings as shown below.

Lecture The instructor will give a lecture about the various topics as indicated on the syllabus on Mondays and Wednesdays. Do the assigned reading before the class period and come ready to discuss the topics and ask questions.

Labs In each lab section on tuesdays, you will perform an experiment to demonstrate the class topics. The lab for each week will be posted on the syllabus. Read, understand, and do any prep exercises for each lab before class in your logbook. Depending on student/equipment ratio, you may work with a partner on some labs, however you should take your own measurements/date and do your own data analysis. You will keep a record of your experiments in a lab notebook and that notebook will be graded. Excepting a final project at the end of the semester, there are no lab reports. Your observations, data, data analysis and conclusions must be documented in your lab notebooks. Follow these [logbook guidelines](#).

Please come to every lab period and on time. If you miss a lab period, you need to provide a doctors excuse (or similar) to make it up. You will only be allowed to complete a lab outside of lab period with consent of instructor. Do not assume that you can by default.

Final Project For the last, approximately, 3 weeks of class you will work on a final "independent" project. For this project you will continue to keep up your logbook, but you will also give an oral presentation to the class. See labs page fore more details.

Homework Homework will consist of problems, due approximately weekly, taken from the textbook, from the lab preparation assignments, and from other sources. Each assigment will be posted on the syllabus. You should take the the time to do these carefully and understand them. They will be very good preparation for the exams. Your written solutions will be collected and graded and will count as part of your course grade.

Exams There will be three in-class exams throughout the semester. They will consist of problems very similar to the homework. There will be no final exam. The dates for these exams will be posted on the syllabus.

Grading Your course grade will be based on these items with the following weighting:

- Three in-class exams (10% each) - 30%
- Homework - 25%
- Laboratory: in-class work and logbook - 25%
- Final project/presentation - 20%

Academic Integrity As a student at IU, you are expected to adhere to the standards detailed in the [Code of Student Rights, Responsibilities, and Conduct](#).

Academic misconduct is defined as any activity that tends to undermine the academic integrity of the institution. Violations include: cheating, fabrication, plagiarism, interference, violation of course rules, and facilitating academic dishonesty. When you submit an assignment with your name on it, you are signifying that the work contained therein is yours, unless otherwise cited or referenced. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged. All suspected violations of the *Code* will be reported to the Dean of Students (Office of Student Conduct) and handled according to University policies. Sanctions for academic misconduct may include a failing grade on the assignment, reduction in your final course grade, and a failing grade in the course, among other possibilities. If you are unsure about the expectations for completing an assignment or taking a test or exam, be sure to seek clarification from your instructor in advance.

Special Accommodations

Every attempt will be made to accommodate qualified students with disabilities (e.g. mental health, learning, chronic health, physical, hearing, vision neurological, etc.) You must have established your eligibility for support services through the appropriate office that services students with disabilities. Note that services are confidential, may take time to put into place and are not retroactive; Captions and alternate media for print materials may take three or more weeks to get produced. Please contact [Disability Services for Students](#) as soon as possible if accommodations are needed.

[Rex Tayloe](#)
