IU Physics P460
Modern Optics, Spring 2016
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; wave guides; holography; masers and lasers.

Instructor

Rex Tayloe
Swain West 336/ISAT Hall (cyclotron building) 113B
855-3057
email: rtayloe@indiana.edu
Office Hours:
M,W 9:30-11:00a, T: 1:00-2:30p in office (SW336) 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

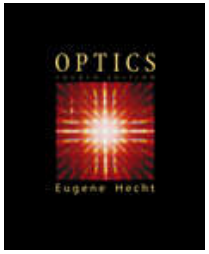
Prerequisites

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 ONCOURSE page for this course.

Required Materials



- Textbook: Eugene Hecht, *"Optics"* , Addison-Wesley, 4th ed., 2002, (ISBN-10: 0805385665). We will be use this text to guide our studies in optics in this class. Will place a copy on reserve in the Swain 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 the prep exercises for each lab before class. Depending on student/equipment ratio, you may work with a partner on some labs, however you should take you 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 the 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. 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. More details will be provided.

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 two in-class exams approximately 1/3 and 2/3 through 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:

- Two in-class exams (15% each) - 30%
- Homework - 25%
- Laboratory: in-class work and logbook - 25%
- Final project/presentation/paper - 20%

Special Accommodations

If any student requires assistance or appropriate academic accommodations for a disability, please contact me after class, during my office hours or by individual appointment. You must have established your eligibility for disability support services through the Office of Disabled Student Services in 096 Franklin Hall, 855-7578.

The Physics Department disabilities representative is Dan Beeker. His office is in Swain West, room 115. His phone and e-mail are 855-5903, debeeker@indiana.edu. You are encouraged to contact him if you have questions about or difficulties with departmental accommodations.

Rex Tayloe
