Physics 410: Optics

Fall 2011

Optics is the study of the nature of light, its properties, and various phenomena due to light mater interaction. The development of lasers, fiber optics, and various optical materials made optics one of the most active fields of physics.

Instructor: Dr. Abdullatif Hamad
Office: SL 2315, Phone: (618) 650-2897
Office Hours: MWR 1:00-2:00 PM or by appointment.
Email: ahamad@siue.edu

Text: Optics, 4th Ed., Eugene Hecht

Course Structure: This is not a normal lecture course. We will spend most of the class time working and discussing hands-on content problems. This class format is aimed to improve your ability to connect the mathematics, theory, verbal, and written explanations to real world problems. Due to the nature of the problems you will need to use Excel and Mathcad most of the time. You will be directed to use certain applets in order help you better understand some of the assigned problems.

In order to use the class time effectively you need to come prepared. The textbook is a valuable resource. Therefore, it is essential that you read the assignments before the class time. *Since many of the homework problems require collecting data it essential that you attend all classes.*

Objectives:
1. To learn and understand basic geometric optics and the wave nature of light.
2. To learn and understand basic phenomena due to light matter interaction.
3. To learn and understand some applications of optics.

Course Outline: We will cover good portion of the material in the text. However, we will not follow the order of topics designed by the author in some cases. The material can be divided into three categories:

1. Geometrical Optics: Ch 4, 5, and 6.
2. Physical Optics: Ch 2-4, and 7-10.
3. Coherent Optics: Ch 11-13.

Homework: Approximately, there will be 1 homework (HW) set every week. Most of the homework will be hands-on. The solution to the HW problems must be full and clear. This requires the use of English language and mathematical logic.

Exams: There will be three "in class" exams. Also, there will be a comprehensive final exam. All exams will be closed-book/closed-notes. The questions in the exams will include derivations from the book, problems from the homework, and new problems (problems that you did not see before). The use of a calculator is permitted. The use of computers, math tables, dictionaries, other written materials, and scratch papers are prohibited. I will provide you with a formula sheet. All work must be done directly on the exam papers provided. Failure to follow these rules will result in an **F** for the course.

Course Grade: Course Grade will be based on exams, homework and laboratory activities.

Exams	36%
Homework	40%
Final Exam	24%

Graduate Students: graduate students are required to do 20% extra work for this course. This will be in the form of extra homework problems and exam problems.

Approximate Grade Scale: 90-100 →A, 80-89→B, 70-79→C, 60-69→D, 0-59→F

Make-Ups: There will be no "make-ups" for missed homework, or exams (including the final exam). In case of illness or family crises, you must provide documentation to support your claim. The grade for the missed exam will be calculated from the average grade of the other exams. If you know in advance that you will miss assignments or an examination, please make arrangements with me ahead of that time.

Special Accommodations: Students with special needs are encouraged to contact the instructors or Disability Support Services {RH1218, x3726} prior to the third week of the course. If official university business requires you to miss a class, please contact the instructor in a timely fashion.

 Extra Help: You are encouraged to see me during office hours. If you want to see me at any other time you need to set an appointment by e-mail or phone.