

Physics 408
<< Optics >>

Spring 2020

Instructor: Dr. Y. H. Shih

Office: PHYS 310

Telephone: 2558 (o), 1933 (Lab.)

Lectures: Mo We Fr 3:00-3:50pm

Room: Math & Psychology 008

Text: Eugene Hecht <<Optics>>

References: Born & Wolf <<Optics>>

Robert Guenther <<Modern Optics>>

J.D. Jackson <<Classical Electrodynamics>>

Prerequisites: Student should have had a standard undergraduate course in intermediate Electromagnetic Theory and a standard undergraduate course in Mathematical Physics or Engineering Mathematics. In particular, it will be assumed that the students understand the basic theory of ordinary differential equation, basic material about Fourier transform and vector analysis.

Homework: Homework due day will be noticed with the assignment. You are encouraged to discuss the problems together; however, each person should work out their assignment *independently*. Assignments are to be written up professionally with computer graphics where appropriate. The computer worksheets should be readable by anyone. This requires explanations of what you are doing.

Grading Method: Homework 20%, Midterm 30%, Final 50%.

Office Hours: W 12:00-3:00pm. I am usually in my Lab. (Rooms 010, 011) and happy to speak with you any time. Call me before your visit.

Topic Outline:

- I. Maxwell's Equations and EM Wave Theory
- II. Measurement of Light
- III. Interference and Diffraction (Part I)
- IV. Fourier Optics
- V. Interference and Diffraction (Part II)
- VI. Coherence Theory
- VII. Imaging and Fourier Transform
- VIII. Laser Physics and Nonlinear Optics
- IX. Quantum Optics (Depending on the progress)