

PHYC/ECE 463, Advanced Optics I
www.optics.unm.edu/sbahae/PHYC463/

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Tel: 277-2080, e-mail: msb@unm.edu
Text: Optics, by M.V. Klein and T.E. Furtak, , Wiley & Sons Inc.
Other References: (*elementary*) Optics, by E. Hecht, Adison-Wesley Publishing Company,
(*advanced*) Principles of Optics, by Born & Wolf, Pergamon Press
Grading: Midterm 35% , Final: 35% , weekly homework: 30%
Office hours: Wednesdays, 2-3 pm. or by appointment
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Tentative Syllabus

1- Introduction

- electromagnetic theory, Maxwell's equations
- modern developments (relativistic optics, quantum optics)

2- Optics of Planar Interfaces

- Maxwell's equations in matter
- reflection and transmission (Fresnel's Laws)
- prism optics
- dielectric waveguides

3- Geometrical Optics

- ray tracing
- imaging (spherical and aspherical surfaces, thin lenses, mirrors,..)
- paraxial optics
- matrix method
- thick lenses
- examples of optical systems (human eye, telescopes, microscopes, ...)
- aberration

5- Interference

- two-beam and multi-beam interference
- interferometers, applications

6- Polarization

- states of polarization
- polarizers, waveplates
- matrix techniques
- crystal optics, tensor properties

7- Diffraction (introductory)

