

EE-2190

Introduction to Photonics

Curricular Designation: CpE: N/A, EE: elective

Catalog Description: Topics include basic geometrical and wave optics, fiber optics, lasers, detectors, and optical communication systems. *Credits:* 3.0 *Lec-Rec-Lab:* (3-0-0) *Semesters Offered:* Spring *Restrictions:* Must be enrolled in one of the following Major(s): Computer Engineering, Electrical Engineering *Pre-requisites:* MA 3521 and PH 2200(C).

Textbooks(s) and/or Other Required Materials:

E. Hecht, *Optics, 4th Edition*, Addison-Wesley, San Francisco, 2002.

Prerequisites by Topic:

Familiarity with the concept of waves, and their mathematical description.

Familiarity with the basics of electromagnetics and geometrical optics.

Course Objectives:

1. Understand the basics of light wave propagation.
2. Understand the dual wave-particle nature of light.
3. Understand geometrical optics and the basics of lens system analysis.
4. Understand the basics of polarization, and polarization sensitive optical devices.
5. Understand the basics of interference phenomenon.

Topics Covered:

1. History of optics.
2. Wave motion
3. Electromagnetic theory, photons, and light.
4. Propagation of light.
5. Geometrical optics.
6. Polarization.
7. Interference.

Relationship of Course to Program Outcomes:

- **CpE:** N/A
- **EE:** Outcome: a via topic(s): 2-7
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Outcome: M via topic(s): 2-7

Contribution of Course to Meeting the Professional Component:

- **CpE:** N/A
- **EE:** Engineering Topics

Class/Laboratory Schedule (note: 1 hour = 50 minutes):

- Lecture: 45 hours = 3 hours/week for 15 weeks

Prepared by:

Michael C. Roggemann, Professor of Electrical Engineering May 5, 2004