

COURSE: EECS 334. TITLE: Principles of Optics. PREREQUISITES: Physics 240.		ELECTIVE.
TEXTBOOK: Hecht, <i>Optics</i> , Addison-Wesley, 2002.		
CATALOG DESCRIPTION: Basic principles of optics: light sources and propagation of light; geometrical optics, lenses and imaging; ray tracing and lens aberrations; interference of light waves, coherent and incoherent light beams; Fresnel and Fraunhofer diffraction. Overview of modern optics with laboratory demonstrations.		
COURSE OBJECTIVES: 1. To provide students with overviews of basic and modern (ultrafast and fiber-optics) optics; 2. To teach students the basics of geometrical optics, microscopes, telescopes, magnifiers, ray tracing; 3. To teach students basics of Fresnel & Fraunhofer diffraction & how to compute diffraction patterns; 4. To teach students the basics of interferometers (Michelson, Mach-Zehnder and Fabry-Perot.).		TOPICS COVERED: 1. Geometrical optics: paraxial and some aberration theory 2. Geometric optics: lens & imaging 3. Interference & interferometers 4. Fresnel & Fraunhofer diffraction 5. Coherent and incoherent light 6. Special topics (e.g., holography)
COURSE OUTCOMES [Program Outcomes Addressed] 1. Ability to use ray tracing to compute the location and magnification of an image; [1,13] 2. Ability to compute simple diffraction patterns (fringe profile and localization; periodicity); [1,13] 3. Ability to measure spectra using diffraction gratings, and interference for other measurements; [1,13] 4. Ability to measure polarization using polarizers; to determine coherence of a light beam; [1,13]		ASSESSMENT (Course outcomes) 1. Weekly problem sets [1,2,3,4] 2. 1 midterm and 1 final exam [1,2,3,4]
PROGRAM OUTCOMES ADDRESSED: 1 PROFESSIONAL COMPONENT ADDRESSED: 13 PREPARED BY: Andrew E. Yagle on Nov. 8, 2004	CLASS/LABORATORY SCHEDULE: LECTURES: 3 per week @ 50 minutes. RECITATION: 1 per week @ 1 hour	

COURSE DESCRIPTION: University of Michigan, College of Engineering, ELECTRICAL ENGINEERING PROGRAM