

Department	Electrical and Computer Engineering
Course Number	EE 482
Course Title	Electro-Optical Systems
Course Designation	Elective
University Catalog Description	Semesters offered: Fall Prerequisites: EE 334 or consent of instructor. Provides an overview of electro-optic systems and components. Lectures will cover ray optics, scalar wave optics, laser and Gaussian beam optics, light sources, detectors, and electro-optic and acoustic-optic photonic devices. Laboratory experiments will introduce basic photonic instrumentation and measurement techniques.
Faculty Coordinator	Dr. David Dickensheets
Prerequisites by Topic	Maxwell's equations, plane wave propagation, reflection and refraction.
Textbook	"Fundamentals of Photonics," by Saleh and Teich, John Wiley & Sons, 1991.
Course Objectives	This course gives students a hands-on introduction to electro-optical systems and components. Roughly half of the course is devoted to optical theory, with the remainder devoted to devices and systems. Laboratory experience figures prominently in the course.
Course Learning Outcomes	Students completing EE 482 are expected to: 1) understand ray, scalar wave and beam theories of optical propagation in bulk media. 2) understand polarization and polarization control elements. 3) have developed an appreciation for different types of light sources, and the concepts of spatial and temporal coherence. 4) have developed an appreciation for types of light detectors, and the concepts of sensitivity, optical and electronic noise and signal-to-noise ratio. 5) have been exposed to electro-optic, magneto-optic and acousto-optic effects and practical devices based on those effects. 6) have developed some skill at evaluating an electro-optical system to assess its function and performance.
Topics Covered	Topics will include: ray optics, scalar wave optics, laser and Gaussian beam optics, light sources, detectors, noise in electro-optic systems, electro-optic and acousto-optic photonic devices, case studies of electro-optical systems.
Class/Laboratory Schedule	Lecture: twice weekly 50 minute sessions; Lab: weekly 1 hour 50 minute session.
Professional Component	Course explores applied electromagnetic theory and practice, electronic analysis and measurement, experiment design and implementation.
ECE Program Outcomes	a. An ability to apply knowledge of mathematics, science, and engineering. b. An ability to design and conduct experiments, analyze and interpret data. c. An ability to design a system, component, or process to meet desired needs. d. An ability to function on multi-disciplinary teams (course constituency has been primarily students from ECE and Physics). e. An ability to identify, formulate, and solve engineering problems. g. An ability to communicate effectively. i. A recognition of the need for, and an ability to engage in life-long learning. k. An ability to use the techniques, skills and modern engineering tools. n. An ability to analyze electrical and electronic system.
Total Credit Hours	3
Prepared by	D. Dickensheets, 5/09