EEL 6563 Fiber Optic Communications

Credits: 3 credits

Textbook, title, author, and year: Fiber Optic Communications, 5th Edition, John Palais, Prentice Hall, 2005

Reference materials: Optical Fiber Communications, 4th Edition, G. Keiser, McGraw Hill, 2011, An Introduction to Fiber Optic Systems, J. P. Powers, Aksen Associates, 1993

Specific course information:

1. To review of optics
2. To develop the fundamentals of principles of optical waveguides
3. To understand the principles and application of optical sources
4. To understand the principles involved with the detection of light
5. To understand the role of couplers and detectors in fiber optics

Catalog description: Optical fiber waveguides, optical sources and detectors, optical modulation and demodulation, fiber optic components and devices, noise in optical systems, system design.

Prerequisites: Prerequisite: EEL 4512

Specific goals for the course: This course introduces graduate students in computer and Electrical Engineering to the principles of fiber optic communications. Scope includes guided wave propagation, optical fibers, optical sources and detectors, optical modulation and demodulation, practical coupling techniques, noise in optical systems, system design and applications.

Brief list of topics to be covered:

1. Introduction and review of optics and electromagnetic waves
2. Dielectric Slab Waveguides
3. Optical Fiber Waveguides; step and graded index fibers; attenuation and fiber cables
4. Light Sources; semiconductors, LED, laser diodes and optical amplification
5. Light detectors; ; p-n, p-i-n, and avalanche photodiodes
6. Couplers and Connectors
7. Optical Modulation and demodulation
8. Noise in Optical Systems
9. Fiber Optic System Design, Applications and Trends