

EEE 448 Fiber Optics (3) [F]

Catalog Data:

Principles of fiber optic communications.
Lecture, Technical Elective.

Prerequisite:

EEE 341

Textbook:

Fiber Optic Communications, Joseph C. Palais, Prentice-Hall, 2005, 5th edition.

Coordinator:

J.C. Palais, Professor

Prerequisites by topic:

1. Electromagnetic theory through Maxwell's equations, the wave equation, and plane wave propagation (as in EEE 341).
2. Spectral analysis (as in EEE 203).
3. Electric circuits (as in EEE 202).

Course Objective:

To give students the ability to understand, specify, and design fiber-optic communications components and systems.

Course Outcome(s):

1. Students will learn the fundamentals of fiber optic communications.
2. Students will learn the applications of fiber optic communications
3. Students will be able to converse with technologists in the field of fiber optic communications.

Course Topics:

1. Fiber optic communications systems (1 week)
2. Optics review (2 weeks)
3. Lightwave fundamentals (2 weeks)
4. Integrated optic waveguides (2 week)
5. Optic fiber waveguides (4 weeks)
6. Optical sources and amplifiers (2 weeks)
7. Light detectors (2 weeks)

Computer Usage:

A number of simulation programs are available to students on the Internet. Many of the simulations are used to demonstrate principles during the lectures. Students are allowed, but not required, to complete homework problems on the computer.

Laboratory Experiments: None

Course Contribution to Engineering Science and Design:

Students learn to analyze dielectric waveguides by applying appropriate boundary conditions to solutions of the electromagnetic wave equation. Students learn the capabilities of various types of fiber optic structures in terms of information capacity and transmission efficiency.

Course Relationship to Program Outcomes:

a: Students do numerous problems in homework and exams requiring them to critically evaluate technical problems and their possible solutions. The students are required to apply basic mathematical and scientific principles to the understanding of fiber optic components, systems, and design.

People preparing this description and date of preparation: Joseph Palais, September 15, 2008. K. Tsakalis, June 2015.