



Course Code ECE-446	Course Title Fiber Optics	ECTS Credits 6
Department Engineering	Semester Fall or Spring	Prerequisites ECE-210, ECE-350
Type of Course Elective	Field Engineering	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 4 th	Lecturer(s) Dr Antonis Hadjiantonis
Mode of Delivery Face-to-face	Work Placement N/A	Co-requisite None

Objectives of the Course:

The main objectives of the course are to:

- introduce optical communications and their evolution over the last decades
- examine light generation and detection
- analyze the various optical transmission limitations (attenuation, dispersion etc.)
- engineer (in terms of choice of equipment, transmission bandwidth and distance) an optical link by considering dispersion and power limitations
- provide an entry-level hands-on experience of a fiber optic link and use fiber to transmit a simple analog sound signal (experiment)

Learning Outcomes:

After completion of the course students are expected to be able to:

1. define the basic limitations of optical transmission
2. identify the basic elements of a point-to-point optical communication link
3. evaluate the basic principles of operations of light sources and light detectors
4. diagram how noise limits transmission length and bandwidth
5. diagram how dispersion and attenuation affect transmission length making use of the bandwidth-length product
6. design (in other words, engineer) a basic point-to-point optical transmission link
7. experiment with a fiber link on a LabVolt FACET module

Course Contents:

1. Introduction to optical fibers and Ray theory transmission
2. Optical Waveguides and transmission characteristics of optical fibers
3. Light sources, optical detectors and all-optical amplifiers
4. Modulation, noise and detection
5. Digital Transmission over optical fibers
6. System Design
7. Experiment(s) on LabVolt FACET optical fiber modules.

Learning Activities and Teaching Methods:

Lectures, Experiment(s)

Assessment Methods:

Homework, Projects, Mid-Term, Final Exam.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
J. Palais	Fiber Optic Communications	Prentice Hall	2005	0-13-008510-3

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
G. Keiser	Optical Fiber Communications	McGraw Hill	2000	0-07-232101-6