



Course Syllabus

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

Course Objectives:

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 Content:

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 / Readings:

Title	Author(s)	Publisher	Year	ISBN
Fiber Optic Communications	J. Palais	PEARSON EDUCATION; 5th edition	2011	978-8131717912

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Optical Fiber Communications (5E)	G. Keiser	McGraw Hill	2013	978-1259006876