

COURSE OUTLINE

DCOM 161

Fiber Optics

3 Semester Hours

The Community College of Baltimore County

Description

Fiber Optics

Examines the fundamental principals behind basic data and voice transmission via fiber optic cable; covers light theory, refraction, reflection, critical angle, cable mode and index ratings, and installation and termination techniques.

Course Objectives

Upon completion of this course the student will be able to:

- A. Describe how optical fibers optic transmit light.
- B. Identify the components of optical fiber.
- C. Describe the technical advantages of optical fiber.
- D. Explain the causes of optical fiber attenuation.
- E. Describe the differences between single mode and multi-mode optical fibers.
- F. Explain the Index of Refraction.
- G. Describe Fiber Distributed Data Interface
- H. Describe the advantages and disadvantages of copper and optical fiber.
- I. Describe cable jacket ratings.
- J. Identify different cable constructions: Simplex, Zipcord, Tightpack, Breakout, and Armored cables.
- K. Describe various cable installation techniques.
- L. Identify different fiber optic connectors and splices.
- M. Demonstrate various connectorizing techniques.
- N. Use a fusion splicer to splice fiber optic cables.
- O. Perform a cable plant Link loss Budget analysis.
- P. Describe fiber optic safety procedures.
- Q. Test and troubleshoot fiber optic cables using fiber optic power meter, test source, OTDR, cable tracer, and inspection microscope.

Major Topics

- A. Fiber Optic Basics
 - 1. Optical Fiber
 - 2. Fiber Manufacture
 - 3. Fiber Applications
 - 4. Fiber Performance

- B. Fiber Optic Networks
 - 1. A Matter of Economics
 - 2. Fiber or Copper?
 - 3. Futureproofing the Installation
- C. Optical Fiber Cables
 - 1. Optical Fiber Construction
 - 2. Choice of Cables
 - 3. The National Electrical Code
- D. Fiber Optic Connectors, Splices, and Tools
 - 1. Fiber Joints (Connections)
 - 2. Attenuation
 - 3. Connectors
 - 4. Splices
 - 5. Tools
- E. Cable Plant Link Loss Budget Analysis
 - 1. Cable Plant Passive Component Loss
 - 2. Equipment Link Loss Budget Calculation
- F. Fiber Optic Installation Safety
 - 1. Bare Fiber Safety
 - 2. Fiber Optic Installation Safety Rules
- G. Fiber Optic Testing
 - 1. Optical Power
 - 2. Optical Fiber Testing
 - 3. Connector and Splice Loss Testing
 - 4. Testing the Installed Fiber Optic Cable Plant
 - 5. Couplers and Switches
 - 6. Fiber Optic Datalinks

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member and will include the following: a minimum of five (5) major graded assignments possibly including ten (10) quizzes, ten (10) lab projects, five (5) hourly exams, a midterm exam and a final examination.