

ITSC 105: FIBER 1

Foothill College Course Outline of Record

Heading	Value
Units:	1
Hours:	15 lecture per quarter (15 total per quarter)
Prerequisite:	Completion of recognized sound and communication apprenticeship or equivalent and recent employment as an installer/technician in the sound and communication industry.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Description

Covers safety involved with optical cable, optical cable terms, communications over optical cable, fiber optic cable types, bandwidth performance, the effects of attenuation, fiber optic termination, splices, and types of connectors.

Course Objectives

The student will be able to:

- A. Define "fiber optics"
- B. Explain the differences between outside plant and premises fiber optics
- C. Identify some advantages of fiber optics
- D. Describe how optical fiber is used in communication systems
- E. Identify safety concerns when working with optical fiber
- F. Explain how optical fiber transmits light
- G. Distinguish types of fiber
- H. Discuss the difference between "step-index" and "graded index" multimode optical fiber
- I. Discuss fiber link power budget
- J. Explain how optical fiber transmits light
- K. Distinguish types of fiber
- L. Recognize the physical characteristics of various types of fibers
- M. Discuss fiber performance specifications
- N. Identify the types of fiber optic cables and their applications
- O. Explain how absorption relates to the wavelength used to transmit signals over optical cable
- P. Explain the difference between modal and chromatic dispersion
- Q. Identify the difference between connectors and splices
- R. Describe the requirements for connectors and splices
- S. Describe connector styles
- T. Identify splice types
- U. Describe splicing procedures

Course Content

- A. Introduction
 1. What is fiber optics?
 2. Fiber, copper, or wireless?

3. Standards facilitating fiber applications
- B. Safety
 1. Issues when working with fiber
- C. Terms (Jargon)
- D. Communications
 1. Why use fiber
 2. Fiber optic communication networks
 3. Other applications for fiber
- E. Cables
 1. Design overview
 2. What are optical fibers?
 3. Fiber types and sizes
- F. Bandwidth
 1. Fiber specifications
 2. Components of dispersion
- G. Attenuation
 1. Absorption
 2. Scattering
- H. Connectors or Splices
 1. Joints or terminations
- I. Performance Specifications
 1. Optical loss
 2. Reflectance
- J. Connectors
 1. Styles of fiber optic connectors
 2. Specialty fiber optic connectors
 3. Connector construction
- K. Connector Termination Procedures
 1. Single-mode terminations
 2. Adhesive terminations
 3. Non-adhesive terminations
- L. Splices
 1. Fusion splices
 2. Mechanical splices

Lab Content

Not applicable.

Special Facilities and/or Equipment

- A. When taught via Foothill Global Access, on-going access to email software and hardware; email address.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

- A. Results of assessments
- B. Results of quizzes and tests
- C. Discussion participation

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

- A. Lecture
- B. Group discussion
- C. Demonstration

Representative Text(s) and Other Materials

National Joint Apprenticeship and Training Committee (NJATC).
Reference Guide to Fiber Optics. MD: NJATC Publishers, 2013.

NOTE: This is the standard Sound & Communications textbook/workbook used for this course. Although it may not be within 5 years of the required published date, it is the most current book used when teaching this course. We will adopt the next edition, as it is published.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

A. Reading assignments:

1. Read Reference Guide to Fiber Optics Chapter 4: Link Power Budget
2. Read Reference Guide to Fiber Optics Chapter 5: Optical Fiber
3. Read Reference Guide to Fiber Optics Chapter 7: Attenuation

B. Writing assignments:

1. Describe what a "link power budget" is and how it is determined
2. Describe the difference between "step-index" and "graded index" and what is improved in transmission when graded index is used
3. List the most widely used fiber connectors and explain which connector you would use for new fiber installations and why
4. Describe the biggest cost factors affecting connector installation and explain what you think the biggest challenges for installers/technicians have terminating fiber in the field (optional)
5. Explain what issues or concerns you should consider when fusion splicing in the field (optional)

Discipline(s)

Telecommunication Technology