

## Aerospace Fiber Optics Course Syllabus

### Course Title/Length

Aerospace Fiber Optics (24 hours)

### Course Description

Fiber optics is an emerging technology that is increasingly applied in cutting edge aerospace technology, and is a skill set that is in increasing demand. This course is designed to prepare participants to successfully perform fiber optics work within the aerospace industry.

Participants will learn to work safely with materials used in fiber optics, including how to handle materials during the assembly, routing, installation, inspection, cleaning and testing processes required within the aerospace industry.

### Course Learning Objectives

*Participants who successfully complete the Aerospace Fiber Optics course will be able to:*

- Describe and apply basic principles of how fiber optics work
- Work safely with materials used for fiber optic assembly, routing, installation, cleaning and testing
- Handle fiber optic material to protect the cables from damage during assembly, routing and installation, cleaning and testing
- Route and install fiber optic assemblies with proper routing, protection, tying, support, slack, and drip loops
- Inspect and evaluate fiber optic termini for cleanliness and damage
- Clean fiber optic termini
- Determine your light loss budget and test fiber optic cables

### Knowledge Areas Covered

- Fiber Optic Familiarization
- Fiber Optic Assembly
- Fiber Optic Routing and Installation
- Fiber Optic Inspection and Evaluation
- Fiber Optic Cleaning
- Fiber Optic Testing

### Audience

- Individuals who wish to acquire or improve their Aerospace Fiber Optic skills

- Individuals who seek to increase their value to their employer or their marketability

### Course Prerequisites

- Ability to do basic math

**Course Hours:** 24 hours

**Course Cap:** 10 participants

### Required and Supplementary Student Materials

- Required texts:
  1. *None*

### Course Attendance and Evaluation Criteria

In order to successfully complete this course students must attend a minimum of 70% and must receive a score of 80% or higher on the final exam.

### Course Outline

#### Session 1: Fiber Optic Familiarization

Purpose of this Session:

To prepare students to work around fiber optic materials used on aircrafts

- Introduction
  - Transmission principles
- Fiber Optic Familiarization
  - Terms & Definitions
  - Authority (Controlling document)
  - What is it?
  - History
  - Material Handling
  - Assembly Identification
  - Do's and Don'ts
  - Personal Safety
    - Fiber Optic Hazards – Safety
- Classroom Activity: Q & A Review
- Outside Assignment: No outside assignments are assigned, but it would be beneficial to review the student manual at the end of each day—reading this day's notes and looking over the notes for the next session, so you are better prepared for and have some familiarity with the coming content.

## Session 2: Fiber Optic Assembly

### Purpose of this Session:

Cover the installation and removal of fiber optic assemblies from connectors

- Safety
- Material Handling
- Assembly
  - Installation of Fiber Optic Termini into Connectors
  - Removal of Fiber Optic Termini from Connectors
  - Build up of Connector
- Classroom Exercise: Assemble Fiber Optic Cables
- Rework
- Classroom Activity: Q & A Review Game
- Outside Assignment: None

## Session 3: Fiber Optic Routing and Installation

### Purpose of this Session:

Cover the processes and procedures to route fiber optic cables on aerospace products

- Safety
- Material Handling
- Bundle Tying
  - Protection
  - Lock Stitch
  - Panduit's
  - Tape Tie
  - Classroom Activity: Adhesive Tying Practice
  - Classroom Activity: Plastic Tie Installation Practice
  - Classroom Activity: Tying a clove hitch knot
  - Classroom Activity: Tying fiber optic bundles
- Support
  - Drip loop
  - Slack
- Practice per Quality Requirements
- Routing and Installation
  - Routing Requirements
  - Drip loop
  - Slack
  - Clamping
    - Protection
  - Installation of Connector Receptacles
- Classroom Exercise: Route Cables on practice board
- Classroom Activity: Q & A Review Game

- Outside Assignment: None

#### Session 4: Fiber Optic Inspection and Evaluation

Purpose of this Session:

Cover the examination, evaluation and cleaning of fiber optic end faces.

- Safety
- Material Handling
- Continuity Testing
- Inspection and Evaluation
  - Cleanliness
  - Damage
- Inspection review
- Classroom Exercise: End Face Examination
- Outside Assignment: None

#### Session 5: Fiber Optic Cleaning

Purpose of this Session:

Cover the examination, evaluation and cleaning of fiber optic end faces.

- Termini End Face Cleaning, Cleaning Procedures
  - Clean Blast
  - Dry Swab
  - Wet Swab
  - Pen
- Alignment Sleeve
  - Inspection
  - Cleaning
- Classroom Exercise: Cleaning Practice, Inspect and Clean
- Classroom Exercise: Mating connectors
- Outside Assignment: None

#### Session 6: Fiber Optic Testing

Purpose of this Session:

Cover fiber optic light loss testing

Session 6 Topics:

- Light Loss Testing
  - Budget
  - Set up
  - Process
- Classroom Exercise: Test Cables
- Review
- Classroom Activity: Q & A Review Game
- Final Review
- Final Exam