

## **Fiber Optic Technician Program**

TVPPA's Fiber Optic Technician Program is designed to provide employees with a fundamental understanding of construction, operation, and maintenance techniques used in providing broadband service through fiber optic cable by local power companies. Skills and topics learned in this program should equip employees to operate in the modern area of fiber optics as utilized by power companies across the nation.

### **// Fiber Fundamental Climbing Lab**

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The Fiber Fundamental Climbing Lab is designed to teach you the essentials of climbing as a Fiber Technician. In this five-day lab, you will experience hands-on training by practicing knot tying and climbing a 40-foot pole. You will also gain knowledge in safety, care of climbing tools, hazard recognition and pole top rescue. You will have the opportunity to network with your peers.

PPE and tool inspections are required daily. All climbing tasks and exercises are demonstrated by the instructor. Fall protection equipment is required when climbing. Climbing will be done on a 40-foot pole, but participants can climb a 90-foot pole if requested by sponsor company.

#### **Items to bring to class:**

- Climbing Tools
- Hand-tools
  - Wrench (to tighten 5/8" bolts and nuts, Ex. bell wrench, 8"-12" adjustable wrench)
  - Lineman Pliers (or similar to cut fiber, zip-ties, etc.)
  - Hammer
  - Knife (adequate to cut the belt during hurt-man rescue)
- Rope Approximately 8' in length, no smaller than 3/8" diameter – this will be used to tie knots throughout the week.
- Climbing Boots (or boots they normally climb in)
- Pen, Pencil, and Highlighter
- Rain suits
- PPE
  - Hard Hat
  - Leather Gloves
  - Safety Glasses
  - Clothing Appropriate for Climbing Wood Poles
- Optional: Hand-line or Ox-Block with rope 1/2" or bigger.

### **Topics Covered:**

- Safety
- Work site safety inspection
- Fitting, care, and inspection of climbing tools
- Gaff sharpening
- Inspection and testing of poles and worksite hazards
- Knot tying: bowline, clove-hitch, half-hitch, timber-hitch, square and bowline on a bight
- Pole top rescue at 10' & 35' levels: Screw Driver method and Ox Block method
- Safe and proper climbing techniques
- Proper hand-line use and make-up for storage
- Climbing will be done on 40' pole
- Supply Space Training
  - Hazard Recognition
  - Identification of nominal voltages
  - Key Components to Distribution and Transmission System
  - Basic Distribution System Operation

### **// Fiber Construction Lab**

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The Fiber Construction Lab is designed to teach you the basics of fiber construction. In this five-day lab, you will gain knowledge in Supply Space Training, job briefings, overhead construction of main-line and drop and overhead conductor sagging methods plus have the opportunity to network with your peers.

PPE and tool inspections are required daily. All climbing tasks and exercises are demonstrated by Instructor. Fall protection equipment is required when climbing. Climbing will be done on a 40-foot pole.

### **Items to bring to class:**

- Climbing Tools
- Hand-tools
  - Wrench (to tighten 5/8" bolts and nuts, Ex. bell wrench, 8"-12" adjustable wrench)
  - Lineman Pliers (or similar to cut fiber, zip-ties, etc.)
  - Hammer
  - Knife (adequate to cut the belt during hurt-man rescue)
- Rope Approximately 8' in length, no smaller than 3/8" diameter – this will be used to tie knots throughout the week.

- Climbing Boots (or boots they normally climb in)
- Pen, Pencil, and Highlighter
- Rain suits
- PPE
  - Hard Hat
  - Leather Gloves
  - Safety Glasses
  - Clothing Appropriate for Climbing Wood Poles
- Optional: Hand-line or Ox-Block with rope ½" or bigger.

### Topics Covered:

- Safety
- Work site safety inspection
- Job Briefing
- Knot tying: bowline, clove-hitch, half-hitch, timber-hitch, square and bowline on a bight
- Safe and proper climbing techniques
- Proper hand-line use for: Ground work, pole framing, sagging and bucket operations and make-up for storage
- Supply Space Training (*continued from Fundamental Lab*)
  - Hazard Recognition
  - Identification of nominal voltages
  - Key Components to Distribution and Transmission System
  - Basic Distribution System Operation
- Overhead construction of Main-line and Drop
  - Rigging
    - Fiber Optic Cable Sagging operations
    - Pole Framing
    - Splicing
    - Messenger Installation
  - Bucket Truck Operations
    - Work Zone placement
    - Bucket Truck Spotting for work zone efficiency
- Guy and Anchor Installation
- Overhead conductor sagging methods: Sight and Dynamometer
- The importance of climbing tools being readily available
- Work Area Protection: Traffic Control
- Aerial lift pre-flight inspection/ bucket safety
- Bucket truck rescue methods
- Aerial lift pre-flight inspection/ bucket safety
- Minimum approach distances
- Pole top rescue (*if time allows*): Screw Driver method and Ox Block method

## // Basic Fiber Lab

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This lab is designed to introduce students to fiber. In this 4-day lab, we will introduce students types of fiber, safety, the various design topologies, and tools used to splice/troubleshoot fiber. Students will leave this lab with a base understanding of what fiber can be used for and the foundation to begin splicing in the next lab. Students will have the opportunity to learn from each other about the different types of topologies that are throughout the valley.

### Topics Covered:

- Introduction, Applications, Why Fiber
- Fiber Theory, Types, Geometry, Manufacturing
- Safety
- Tools
- Cables and Cable Structures
- Architectures/Topologies and Splitters
- Connectors

## // Fiber Splicing Lab

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This lab is designed to teach students to splice. The lab will start with the preparation of fiber cables to prepare it to be spliced and properly placed in closures/terminals. Students will prep cables and splice for majority of this 5-day lab. Students will leave this lab with a skill of preparing a cable and splicing it in multiple settings from mainline to service drops.

### Items to bring to class:

- Splicer – Core Alignment splicer is preferred. Clad alignment or fixed v-groove splicer is accepted.
- Cleaver with splicer
- OTDR - Optical Time Domain Reflectometer
- Tools for splicing
  - T-handle for flat drop
  - Cable prep tools – end cuts and mid-entry
  - Stripping tools (250 and 900 micron)
  - Power meter – 1310/1550 nm
  - Fiber identifier (is beneficial but not required)
- Work gloves
- Optical power meter
- Optical light source

- 2-foot piece of different types of fiber you use in your system (armored, ADSS, etc.)
- Splicing diagram from your network
- Splicing tools

### **Topics Covered:**

- Splicing
- Central Office (CO) and Fiber Distribution Hub (FDH) – terminations and splicing
- Closures and Terminals, Success in the Field

## **// Fiber Troubleshooting Lab**

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This 3-day lab is designed to ready students for troubleshooting fiber after splicing is completed. Students will learn to use an OTDR to test and troubleshoot fiber when issues arise. This lab will teach students how to read an OTDR to find faults along the fiber path and determine the distance of an issue when a cut occurs. Students will also learn about the Outside Plant Installation process as well.

### **Items to bring to class:**

- Splicer – Core Alignment splicer is preferred. Clad alignment or fixed v-groove splicer is accepted.
- Cleaver with splicer
- OTDR - Optical Time Domain Reflectometer
- Tools for splicing
  - T-handle for flat drop
  - Cable prep tools – end cuts and mid-entry
  - Stripping tools (250 and 900 micron)
  - Power meter – 1310/1550 nm
  - Fiber identifier (is beneficial but not required)
- Work gloves

### **Topics Covered:**

- Test Equipment and Testing
- Outside Plant (OSP) Installation

## **// Fiber Installation Lab**

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This 3-day lab will teach students the installation process of running fiber into a home or business.

Students will also learn about different ONTs and systems they might use to assist with installation of fiber as well as troubleshooting. This lab will transition to the final exam that students will take after the final parts of the class are covered.

#### **Items to bring to class:**

- Splicer – Core Alignment splicer is preferred. Clad alignment or fixed v-groove splicer is accepted.
- Cleaver with splicer
- OTDR - Optical Time Domain Reflectometer
- Tools for splicing
  - T-handle for flat drop
  - Cable prep tools – end cuts and mid-entry
  - Stripping tools (250 and 900 micron)
  - Power meter – 1310/1550 nm
  - Fiber identifier (is beneficial but not required)
- Work gloves

#### **Topics Covered:**

- Premise Installation
- Optical Network Terminals (ONT)
- Systems
- Troubleshooting, Testing, Certification
- Final Exam