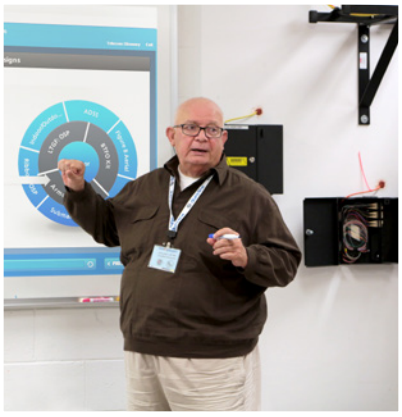
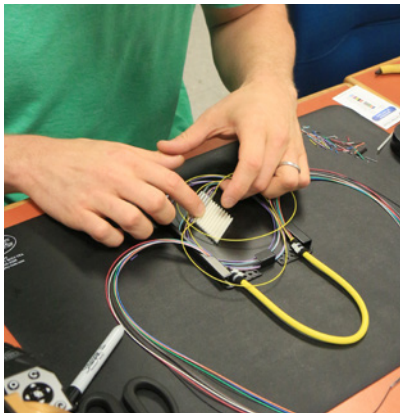
EXPERIENCED INSTRUCTORS • CLASSROOM LECTURES • HANDS-ON LABS • DEMONSTRATIONS


Get Trained...
GET CERTIFIED!

- Fiber Optic
- Premise Wiring
- Wireless & Security
- Juniper Networks
- System Design
- Network Management
- Ethernet Training
- Optical Networking
- Radio Frequency (RF)
- Fiber Standards
- Custom Courses & Onsite Training

COURSE CATALOG

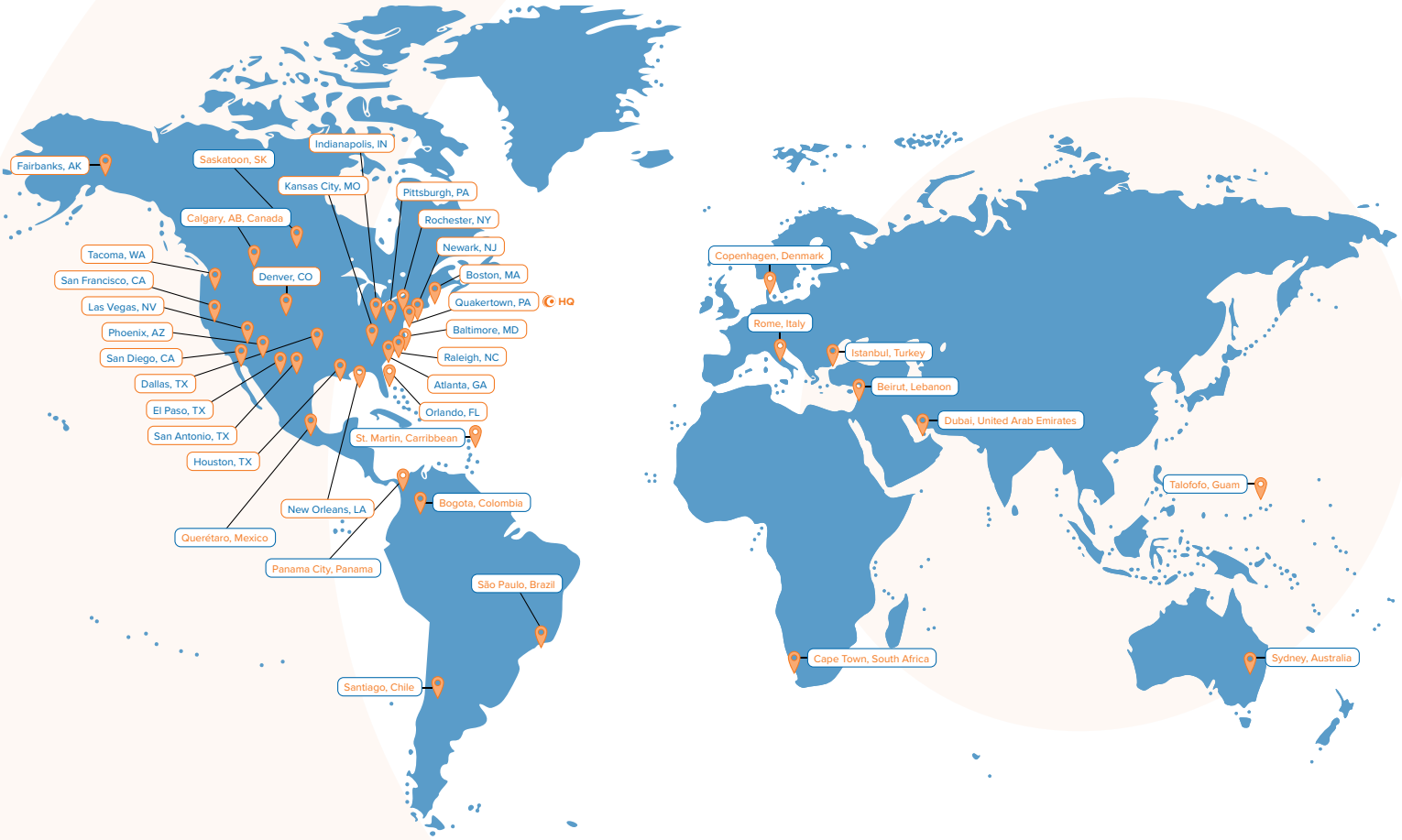
The Fiber School
CERTIFIED TECHNICAL TRAINING

Since our inception, The Fiber School has trained thousands of students and coordinated specialized training throughout the United States and the world: Fortune 500, government, military and internationally in IRAQ, Suriname, Nigeria, Columbia and many other locations.

Our courses have been developed and refined over the years to ensure that the material presented is current, relevant and does not waste your training dollars. Our courses consist of lecture, video and ample time for “hands-on” labs and one-on-one time with the instructor. For your convenience we’ve added a full line-up of online courses which are accessible anytime anywhere.

The Fiber School will train you on the latest equipment from the best manufacturers. This provides you with valuable experience on what equipment is available and how it can be effective. The Fiber School offers a full line of courses designed for the beginner, intermediate and advanced student.

Our instructors have years of experience including field work and in a classroom environment. Our courses are taught at your location or in numerous cities around the country.



Meet Us
ANYWHERE!

With a growing number of regularly scheduled courses around the world and on-site training available to most areas, we can meet you just about anywhere! Have a class of six students or more? We’ll come to you! We take pride in what we do and strive to be the #1 leader in fiber optic training by providing you with the best knowledge, skills and hands-on training.

Get Certified With
THE FIBER SCHOOL

- Top Instructors
- Enhance your skills
- Convenient class schedules
- Training on the latest equipment from the top manufacturers
- Fair and competitive pricing
- Custom on-site training available
- Vendor neutral equipment
- 24/7 Online classes
- Online material available
- Alumni Job Posting

THE FIBER SCHOOL IS PART OF THE ADTELL GROUP.

121 Park Avenue, Quakertown, PA 18951 USA | 1-877-529-9114 | **Training@FiberOptic.com**

Times, locations, and prices are subject to change.

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Fiber Optic

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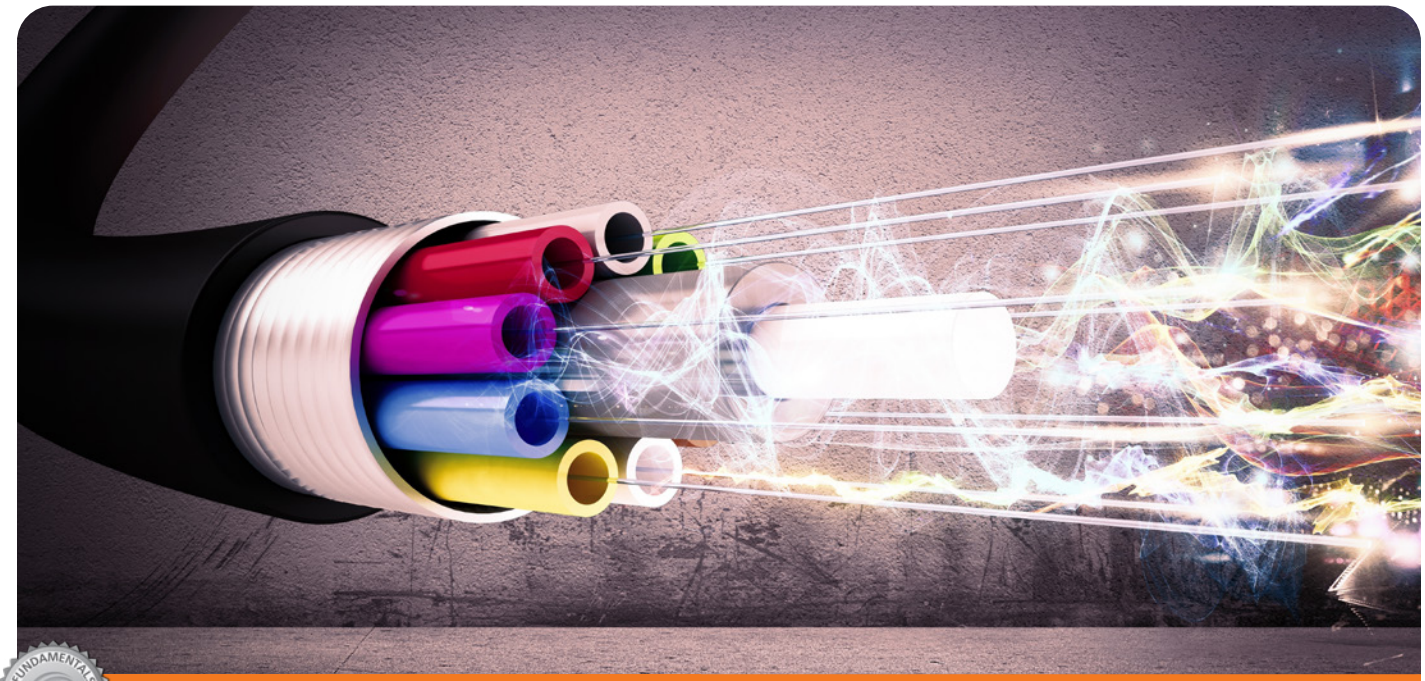
Legal Notice: *Catalog prices and are subject to change without notice.*

Cancellation Policy: *The Fiber School may cancel a course that lacks sufficient enrollment a week before it is scheduled to begin. When a course is canceled, we make every effort to notify all registered students promptly.In the event The Fiber School has to cancel we will work with the student to reschedule to another date/location. You can help avoid cancellation by registering early.*

Student Cancellation: *No refunds are permitted. Substitutions are permitted.*

TR-FOF Fiber Optic Fundamentals



LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **16 HOURS** of online instruction

Fiber Optic Fundamentals training is designed for new or experienced workers who desire a fundamental knowledge of fiber optic theory, codes, standards and practices widely accepted in the telecommunications industry today, or telecom workers seeking a deeper understanding of fiber optic theory and cabling systems. This course is an excellent starting point for those who install, design, or supervise the installation of fiber optic systems or anyone involved in:

Construction or Project Management

- Electrical; Voice/Data; OSP including Customer-Owned OSP; Site or Utility Contractors

End-User Markets

- Education; Commercial; Industrial; Utility (including Telephone, CATV, FTTx, Security)

This course is currently offered as a self-paced, online lecture course. This innovative approach to Fiber Optic Training and certification allows students to minimize expense, time and travel by learning at their own pace, on their own schedule. If you wish to take this course on-site, please contact us about scheduling custom training.

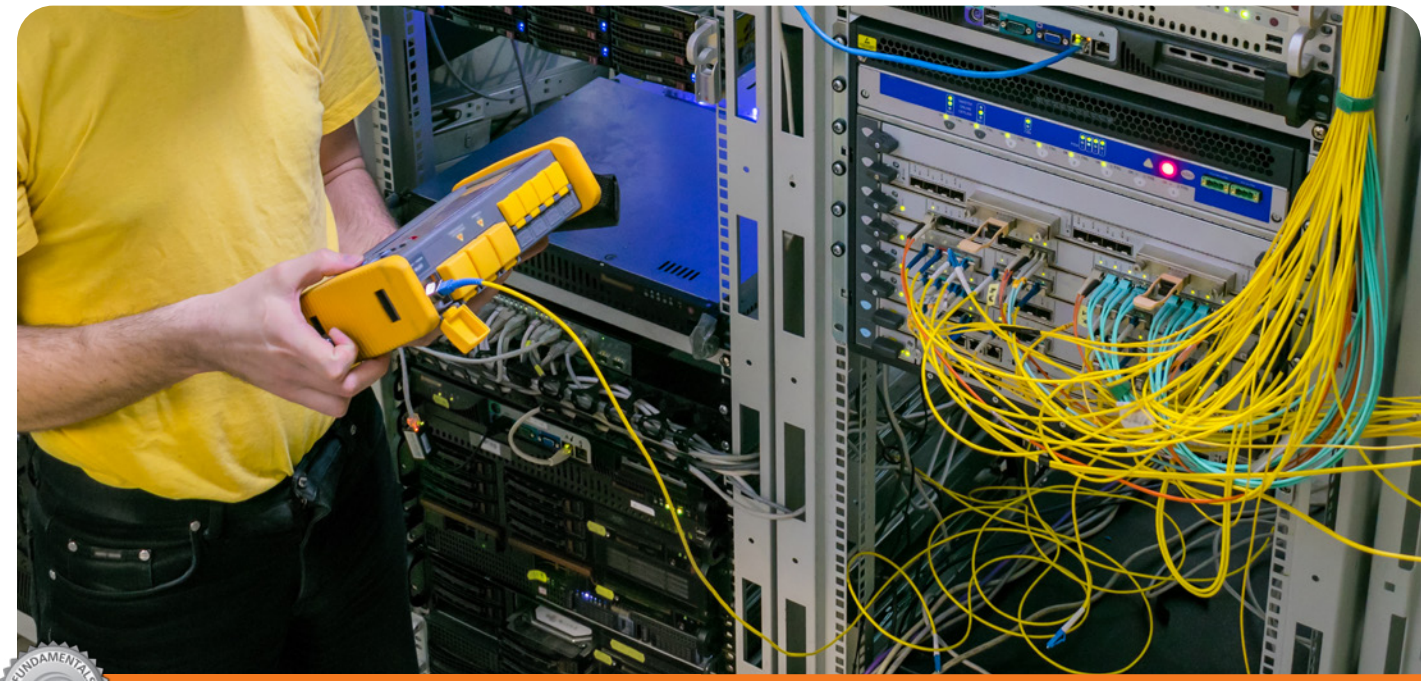
COURSE LECTURES TOPICS INCLUDE

- **Introduction to Fiber Optics:** Advantages and Applications; Terminology and History; The Fundamentals of Light Propagation; Scales of Measurement and the Spectrum; Singlemode and Multimode; Manufacturing, Bandwidth and Linear effects
- **Cables:** Cable Types, Construction and Specifications; Cable Marking; Selection Criteria
- **Connectors & Terminations:** Temporary & Permanent Connections; Connector Types; Mechanical and Environmental Considerations; Performance Specifications; Connector Loss Issues; Splicing Applications
- **Enclosures & Panels:** Panels; Distribution, Patch and Splice Types; Application Issues and Selection Criteria; Aerial and Burial Enclosures; Re-Entry and Expansion Capabilities; Routing and Preparation
- **Test Equipment:** Loss Testing Tools and Equipment; Standards and Methods; Return Loss, Bandwidth and Dispersion; OTDR Theory and Applications; Loss and System Budget Calculations

PRICING COURSES & CERTIFICATIONS

TR-FOF	*Fiber Optic Fundamentals*	**$300**
TC-FOF	*TFS Certification FOF*	**$150**

TR-TAM OTDR Trace Analysis for Managers



LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **6 HOURS** of online instruction

OTDR Trace Analysis for Managers is an online class to train managers in evaluating the traces they receive and see potential issues that may create problems down the road. This class will help managers to better assess the reports and ask the proper questions.

This class is designed to assist managers in understanding the complexities of understanding an OTDR trace. OTDRs can provide valuable information about loss and location of faults, but only if the person interpreting the results understands how to read the data. The trace can show you the power loss but does not provide the source of such loss. Analysis of the trace is complicated since there are multiple causes to a loss. It's important to realize that the OTDR can only provide accurate measurements and proper interpretations if the OTDR is setup correctly.

This course is currently offered as a self-paced, online lecture course. This innovative approach to Fiber Optic Training and certification allows students to minimize expense, time and travel by learning at their own pace, on their own schedule. If you wish to take this course on-site, please contact us about scheduling custom training.

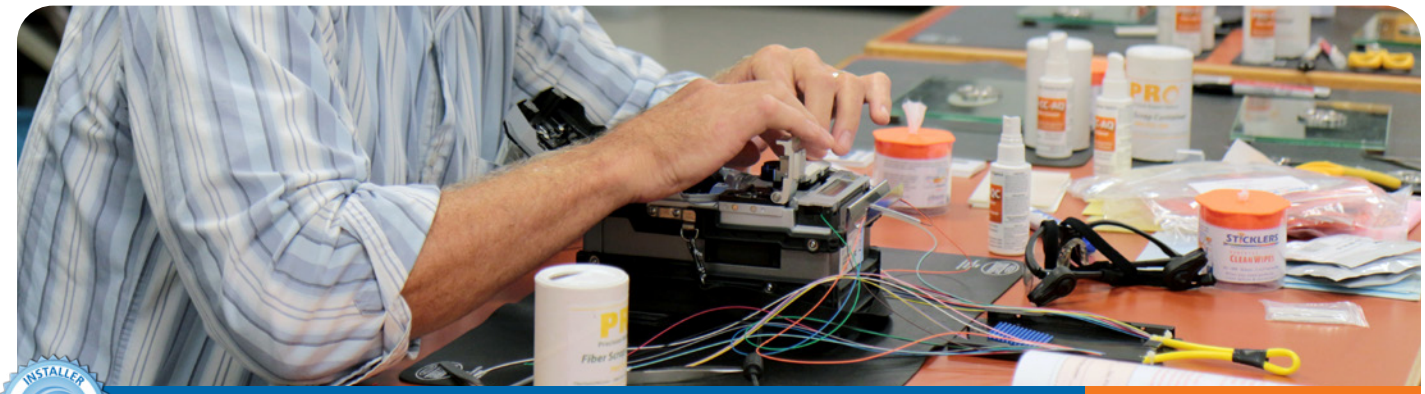
COURSE LECTURES TOPICS INCLUDE

- What does an OTDR do?
- OTDR basics: What does an OTDR measure?
- How does an OTDR create a trace?
- Setting parameters and their effects on a trace
- Understanding events: Non-reflective, Reflective, Gainers, Ghosts
- Optical return loss
- Effects of a launch and/or Landing box

PRICING COURSES & CERTIFICATIONS

TR-TAM	*OTDR Trace Analysis for Managers*	**$200**
TC-TAM	*TFS Certification TAM*	**$150**

TR-CFI Certified Fiber Optic Installer



LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course is designed for those who layout, install or maintain fiber optic cabling systems. It identifies you as an installer able to demonstrate a practical knowledge of fiber optic theory, codes, standards and practices widely accepted in the industry. This training incorporates validating installer skills, including fiber terminations, cable preparations, fusion splicing, OTDR and optical loss testing. These skills are applicable to all the requirements to safely and competently install, maintain, and test fiber optic cabling systems. Knowledge and experience in: Fiber optic advantages and applications, Cables, Connectors and Terminations, Enclosures and Panels, and Test Equipment are desirable but not required prior to taking this course.

This fiber optic installation course is currently offered with a self-paced, online lecture and a hands-on workshop. This innovative approach to Fiber Optic Training and certification allows students to minimize expense, time and travel by learning at their own pace, on their own schedule.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- **Introduction:** Advantages & Applications; Terminology and History; The Fundamentals of Light Propagation; Scales of Measurement and the Spectrum; Singlemode and Multimode; Manufacturing, Bandwidth and Linear Effects
- **Cables:** Cable Types, Construction and Specifications; Cable Marking; Selection Criteria
- **Connectors & Terminations:** Connections; Connector Types; Mechanical and Environmental Considerations; Performance Specifications; Connector Loss Issues; Splicing Applications
- **Splicing:** Fusion and Mechanical; Fusion Splicing; Cable Marking; Mechanical Splicing
- **Enclosures & Panels:** Panels; Distribution, Patch and Splice Types; Application Issues and Selection Criteria; Aerial and Burial Enclosures; Re-Entry and Expansion Capabilities; Routing and Preparation
- **Installation:** Planning and Standards; Premise/LAN Methods; Outside Plant Methods; Aerial and Burial Techniques; Installation Tools and Equipment
- **Test Equipment:** Loss Testing Tools and Equipment; Standards and Methods; Return Loss, Bandwidth and Dispersion; OTDR Theory and Applications; Loss and System Budget Calculations
- **Restoration & Maintenance:** Tools and Equipment; Practical Applications; Time Saving Techniques; Record Keeping and Documentation
- **System Components:** Transmitters and Receivers; Passive Optical Components; Couplers and Splitters; WDM and DWDM Issues
- **System Design:** Equipment; Applications; Time Saving Techniques

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations

PRICING COURSES & CERTIFICATIONS

TR-CFI	*Certified Fiber Optic Installer In-Person 2-Day Class*	**$1,500**
TR-CFI-RCT-1	*Certified Fiber Optic Installer RCT Online Class: Option 1*	**$800**
TR-CFI-RCT-2	*Certified Fiber Optic Installer RCT Online Class: Option 2*	**$3,900**
TC-TFS-CFI	*TFS Certificate: CFI*	**$150**
TC-ETA-FOI	*ETA Certificate: Fiber Optic Installer*	**$150**

TR-CAFI Certified Advanced Fiber Optic Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This Certified Advanced Fiber Optic Installer course is designed for those who layout, install or maintain fiber optic cabling systems. It identifies you as a Certified Advanced Fiber Optic Installer able to demonstrate a practical knowledge of fiber optic theory, codes, standards and practices widely accepted in the fiber optics industry. In addition, this training incorporates five days of individual hands-on training validating advanced fiber optic installer skills, including fiber terminations, cable preparations, fusion splicing, outside plant enclosures, high count armored and non-armored cable, OTDR and optical loss testing. These skills are applicable to all the requirements to safely and competently install, maintain and test fiber optic cabling systems. This course is classified as a Certified Advanced Fiber Optic Installer course and is in between a Level 1 Installer and a Level 2 Technician in the Professional Tracks. Our specialized Professional Tracks are two steps ahead of any other training programs available. These specialty programs build on the existing curriculum and then take it two extra steps – paving your way to professional!

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- **Introduction to Fiber Optics:** Fiber Optic Advantages and Applications; Terminology and History; The Fundamentals of Light Propagation; Scales of Measurement and the Spectrum; Characteristics of Singlemode and Multimode; Manufacturing, Bandwidth and Linear Effects
- **Cables:** Cable Types, Construction and Specifications; Cable Marking; Selection Criteria
- **Connectors and Terminations:** Temporary and Permanent Connections; Connector Types; Mechanical and Environmental Considerations; Performance Specifications; Connector Loss Issues; Splicing Applications
- **Splicing:** Fusion and Mechanical; Fusion Splicing; Cable Marking; Mechanical Splicing
- **Enclosures and Panels:** Panels; Distribution, Patch and Splice Types; Application Issues and Selection Criteria; Aerial and Burial Enclosures; Re-Entry and Expansion Capabilities; Routing and Preparation
- **Installation:** Planning and Standards; Premise/LAN Methods; Outside Plant Methods; Aerial and Burial Techniques; Installation Tools and Equipment
- **Test Equipment:** Loss Testing Tools and Equipment; Standards and Methods; Return Loss, Bandwidth and Dispersion; OTDR Theory and Applications; Loss and System Budget Calculations
- **Restoration and Maintenance:** Tools and Equipment; Practical Applications; Time Saving Techniques; Record Keeping and Documentation
- **System Components and Design Issues:** Transmitters and Receivers; Passive Optical Components; Couplers and Splitters; WDM and DWDM Issues
- **System Design Exercise:** Tools and Equipment; Practical Applications; Time Saving Techniques

COURSE LABS HANDS-ON

- Cable preparation, cleaning and cleaving
- Prepare, splice and assemble a splice tray
- Prepare, splice and assemble a multimode fiber LAN link
- Fusion and mechanical splicing
- Multiple builds with OSP enclosures
- Mid Span cable entry
- Prepare and terminate armored cable
- Perform optical loss testing using an OTDR
- Perform loss and system budget calculations

PRICING COURSES & CERTIFICATIONS

TR-CAFI	*Certified Advanced Fiber Optic Installer*	**$3,500**
TC-CAFI	*TFS Certification CAFI*	**$150**

TR-FTTX FTTx Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

"Fiber to the X" (FTTx) is the hottest network topic since TCP/ IP. In this course, we will discuss various network designs, installations, maintenance and troubleshooting. This is a three-day hands-on course designed to provide students with a practical understanding of FTTx networks. Students will learn the difference between an Active and a Passive Optical Network (PON). The advantages and disadvantages of each system and how they are currently being implemented in the field are featured in this course. Students will learn splicing, testing and installing techniques for an FTTx network.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber to the X (FTTx): FTTx Architecture; OLT Efficiency; Passive Optical Network (PON) Systems: Applications, Networks, Design and Testing; Active Systems: Applications, Networks, Design and Testing; Splitters in PONs; Splitter Signal Loss; Wavelength Division Multiplexing (WDM); Cable Management; FTTx Splicing, Connectorization, Construction and Testing; OSP Concerns; Connectors in OSP; ITU Specifications; Ribbon Considerations; Hardened Connectors vs Field Splicing; FTTx Delivery Options; Active/PON (FTTH) Qualification and Troubleshooting

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- FTTx Assembly & Testing

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-FTTX	*FTTx Specialized Installer*	**$2,400**
TC-FTTX	*TFS Certification FTTx*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-FTTD Fiber to the Desktop Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course will give students a deeper understanding of how to assemble, cable, and test various commercial building systems utilizing, FTTD, a high-bandwidth solution that expands the traditional fiber backbone system directly to desktops and pushes the available bandwidth beyond 10G. This course also explores passive optical networks (PON), commonly utilized in FTTH applications, and its use in commercial buildings.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- FTTD – Bringing Fiber to the Desktop: Hierarchical Star; Centralized Optical Fiber; Fiber to the Enclosure, PONS; Testing Considerations

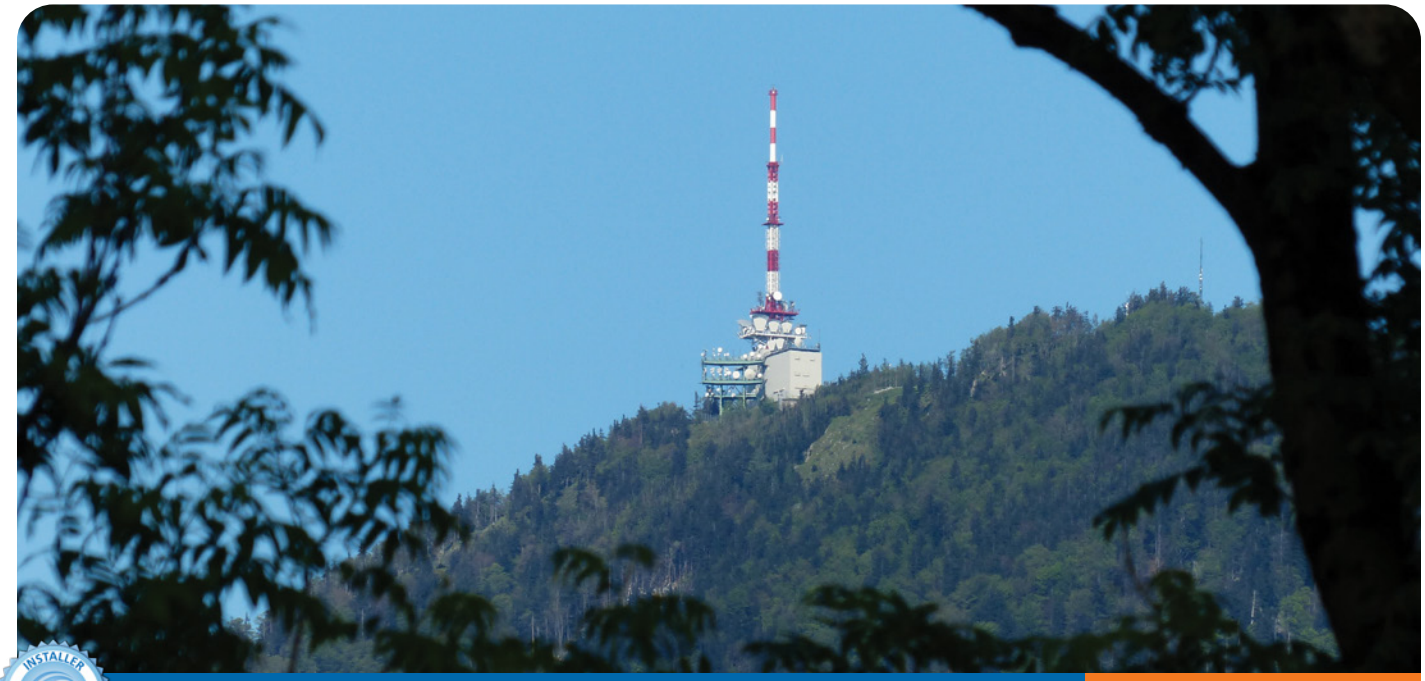
COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- Testing Event Boxes with an OTDR

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-FTTD	*Fiber to the Desktop Specialized Installer*	**$2,400**
TC-FTTD	*TFS Certification FTTD*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-FTAI Fiber to the Antenna Specialized Installer



LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This certified fiber to the antenna / tower installer training course is designed for those who install and test fiber optic cables installed within antenna towers. It identifies you as a tower installer with practical knowledge of fiber optic theory, codes, standards and practices widely accepted in the wireless telecommunications industry. In addition, this training incorporates a three-day hands-on lab, validating installer skills, including fiber cable installation, OTDR testing, connector cleaning and loss prevention. These skills are applicable to all the requirements to safely and competently install, maintain, and test fiber optic antenna systems.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber to the Antenna/Tower: About NATE & OSHA; How Cell Towers Work; FTA/T Architectures; Cabling Practices; Connector & Splicing Practices; Testing Tier 1 & 2 (OTDR)

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Testing Event Boxes with an OTDR
- L-Jack Industrial Connector

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-FTAI	*Fiber to the Antenna Specialized Installer*	**$2,400**
TC-FTAI	*TFS Certification FTAI*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-FWTI Fiber to the Wind Turbine Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This fiber optic installation training course is designed for those who layout, install or maintain fiber optic cabling systems to wind turbines. It identifies you as an installer who is able to demonstrate a practical knowledge of fiber optic theory, codes, standards and practices widely accepted in the fiber optics industry. This training focuses on the supervisory control and data acquisition (SCADA) systems common to wind turbines utilizing fiber optics.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber to the Wind Turbine: Network Topologies; Key Applications; Condition Monitoring; Nomenclature; Wireless Introduction; WT Optical Applications; Condition Monitoring; Wind Turbine Networking; Harsh Environment Fiber Coatings; SCADA Basics; SCADA Architecture; Wind Turbine & Wind Farm SCADA

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- L-Jack Industrial Connector

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-FWTI	*Fiber to the Wind Turbine Specialized Installer*	**$2,400**
TC-FWTI	*TFS Certification FWTI*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-CCTV Closed Circuit TV Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This specialty fiber installer course focuses on today's CCTV systems which are IP addressable and considered to provide interactive and intelligent video surveillance. Students will learn about the concepts of video surveillance, the selection of components and how they are deployed within home and business. Also included are options for implementation over Local and Wide Area Networks (LANs & WANs) and various cabling infrastructures.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- CCTV Specialized Installer: Intelligent Video Surveillance - Overview, Camera & Surveillance Basics; DVS – (Digital Video Security); Camera Basics; Protocols; Digital And Analog Video; Environmental Considerations; Easy setup procedures; PoE (Power over Ethernet); Media Converters to Optical Fiber;

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- CCTV Setting up a CCTV Video Surveillance System

PRICING COURSES & CERTIFICATIONS

TR-CCTV	*Closed Circuit TV Specialized Installer*	**$2,400**
TC-CCTV	*TFS Certification CCTV*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-DAS Distributed Antenna Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course is designed for those who design, install or maintain fiber optic systems in commercial buildings and other facilities. It identifies you as an installer who demonstrates a practical knowledge of fiber optic theory, codes, standards and practices widely accepted in commercial buildings and customer-owned outside environments (campus). In addition, this training incorporates a three-day hands-on lab, validating installer skills, including fiber terminations, cable preparations, installation practices and certification testing procedures. Students will learn skills applicable to all the functions required to safely and competently install advanced fiber communications including DAS cabling deployments.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- DAS – Delivering Mobile Services: DAS Overview; Public Safety; Survey & Design; In-Building Considerations; Antennas; Distribution Equipment; Coverage; Needs Analysis; Installation; System Acceptance; Testing DAS

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- Testing Event Boxes with an OTDR

PRICING COURSES & CERTIFICATIONS

TR-DAS	*Distributed Antenna Specialized Installer*	**$2,400**
TC-DAS	*TFS Certification DAS*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-OGP Oil, Gas, Petrochem Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course provides the practical understanding and skills required to properly design, install, and maintain fiber optics systems in petrochemical environments such as offshore drilling, pipeline, refineries, and process plants and other industrial plant processes. Students will use the latest fiber optic technology and equipment to learn how to splice, connectorize, test, and troubleshoot petrochemical-based harsh environment optical fiber networks in order to increase efficiency, reliability, and on-the-job safety requirements as well as reduce overall production cost and facilities downtime.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optics for the Petrochemical Industry: Harsh Environments Cables & Connectors; Fiber Optic Sensing Cables and Sensors; Fiber Coatings for Harsh Environments; Splicing in a Harsh Environment; Tethers & Umbilicals; SCADA Systems

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- L-Jack Industrial Connector

PRICING COURSES & CERTIFICATIONS

TR-OGP	*Oil, Gas, Petrochem Specialized Installer*	**$2,400**
TC-OGP	*TFS Certification OGP*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-MIL Military Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

Military intuitions have trusted The Fiber School to provide their students with the best training in fiber optics. Our courses feature real world hands on exercises that ensure that students leave the course prepared to tackle new installations, maintenance and repairs of fiber optic networks. Certification from TFS ensures that students have passed the most rigorous exams and understand the course material.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optics for the Military: Tactical Fiber Optic Connectors; Tactical Fiber Optic Assemblies; About Tactical Fiber Optic Cable

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- MIL-C83526/16 Connector Termination
- L-Jack Industrial Connector

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-MIL	*Military Specialized Installer*	**$2,400**
TC-MIL	*TFS Certification MIL*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-MIN Mining Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course addresses the challenges of deploying and maintaining fiber optic networks in harsh mine environments in order to improve employee safety, provide reliable communications, improve and measure process efficiency, and provide continuous monitoring and analysis of the hazardous environments. This course is tailored to the unique environment and applications of underground, open pit, and strip mines, and will provide the knowledge and skill sets required to design, install, and maintain fiber optics in harsh mine environments.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optics for Mining: MSHA approved cables and connectivity Mining Cables; NEMA 4X Enclosures; Harsh Environment Connectivity; Deployable Systems; About MSHA & OSHA; Splicing Practices; Testing Tier 1 & 2 (OTDR)

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- L-Jack Industrial Connector

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-MIN	*Mining Specialized Installer*	**$2,400**
TC-MIN	*TFS Certification MIN*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-PAV Pro Audio/Video Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This three-day course will provide an overview of fiber optic transmission theory, system design parameters, installation guidelines, fiber optic connector and splice termination options, test equipment, testing, documentation, and troubleshooting tailored for Pro A/V applications and installations. The course includes extensive hands-on exposure to fiber optic cable preparation, terminations, testing, and troubleshooting.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- **Introduction to Fiber Optics:** Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- **Fiber Optic Installation Practices:** Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- **Fiber Optics for PRO Audio/Video:** AV connector Fundamentals; Internet Video; 10 Gigabit Networking; CATV over Twisted Pair; Digital Signage; Multiple Matrix Multiple Display; Fiber Optic AV Signal distribution; Fiber Optic AV System Design; Digital Signage; Extenders; Audio and Control Products; Distribution Amplifiers; Switchers; Signal Processors; Matrix Switchers; Cables, Connectors

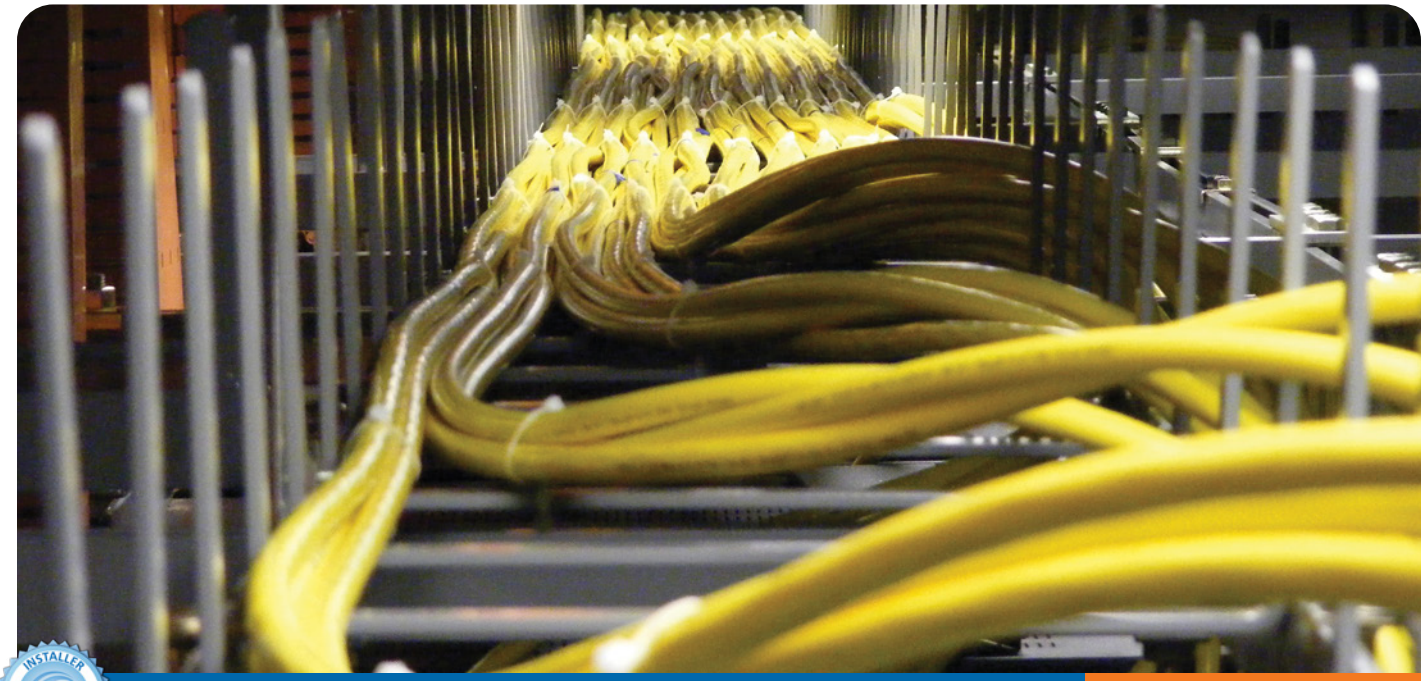
COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- Testing SMPTE (Society of Motion Picture and Television Engineers) Links

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-PAV	*Pro Audio/Video Specialized Installer*	**$2,400**
TC-PAV	*TFS Certification PAV*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-PWSI Premise Wiring Systems Specialized Installer



LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course is designed for those who design, install or maintain copper and fiber optic systems in commercial buildings and outer facilities. It identifies you as an installer who demonstrates a practical knowledge of copper and fiber optic theory, codes, standards and practices widely accepted in commercial buildings and customer-owned outside environments (campus). This course incorporates hands-on training of copper and fiber terminations, cable preparations, installation practices and certification testing procedures. Students will learn skills applicable to all the functions required to safely and competently install advanced copper and fiber communications cabling. All procedures and practices are instructed based on the latest EIA/TIA commercial building cabling standards.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction: The Telecommunications Standards, EIA/TIA 568B Series, EIA/TIA 569A, EIA/TIA 606A, EIA/TIA 607, The National Electric Code
- The Topologies: Physical, LAN Basics, The Premise Wiring System
- Cable Specifications: Media
- Unshielded Twisted Pair (UTP), Screened Twisted Pair (ScTP), Shielded Twisted Pair (STP)
- Category 5e, 6, 7 and beyond
- Fiber Optic Fundamentals: Cable Applications, Backbone, Horizontal, Work Area, Media Types (Cables), Distance Limitations

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- Identify Horizontal Link Components
- 8P8C Catego ry5e/6 Modular Plugs
- 66-Block Termination (Data)
- Category 5E/6 (110) 8P8CJack

PRICING COURSES & CERTIFICATIONS

TR-PWSI	*Premise Wiring Systems Specialized Installer*	**$2,400**
TC-PWSI	*TFS Certification PWSI*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-TEL Telecommunication Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

Optical fibers can be used to transmit light and thus information over long distances. Fiber-based systems have largely replaced radio transmitter systems for long-haul optical data transmission. They are widely used for telephony, but also for Internet traffic, long high-speed local area networks (LANs), cable TV (CATV), and increasingly also for shorter distances within buildings. In most cases, silica fibers are used, except for very short distances, where plastic optical fibers can be advantageous.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optics for Telecommunications: Basic Network Applications; Topologies; Nomenclature; Cabling Applications; Telecom Spaces; DS1/T1; DS3; Multiplexing; SONET; FTTx applications; ITU Specifications; Testing Tier 2 (OTDR); OTDR Anomalies

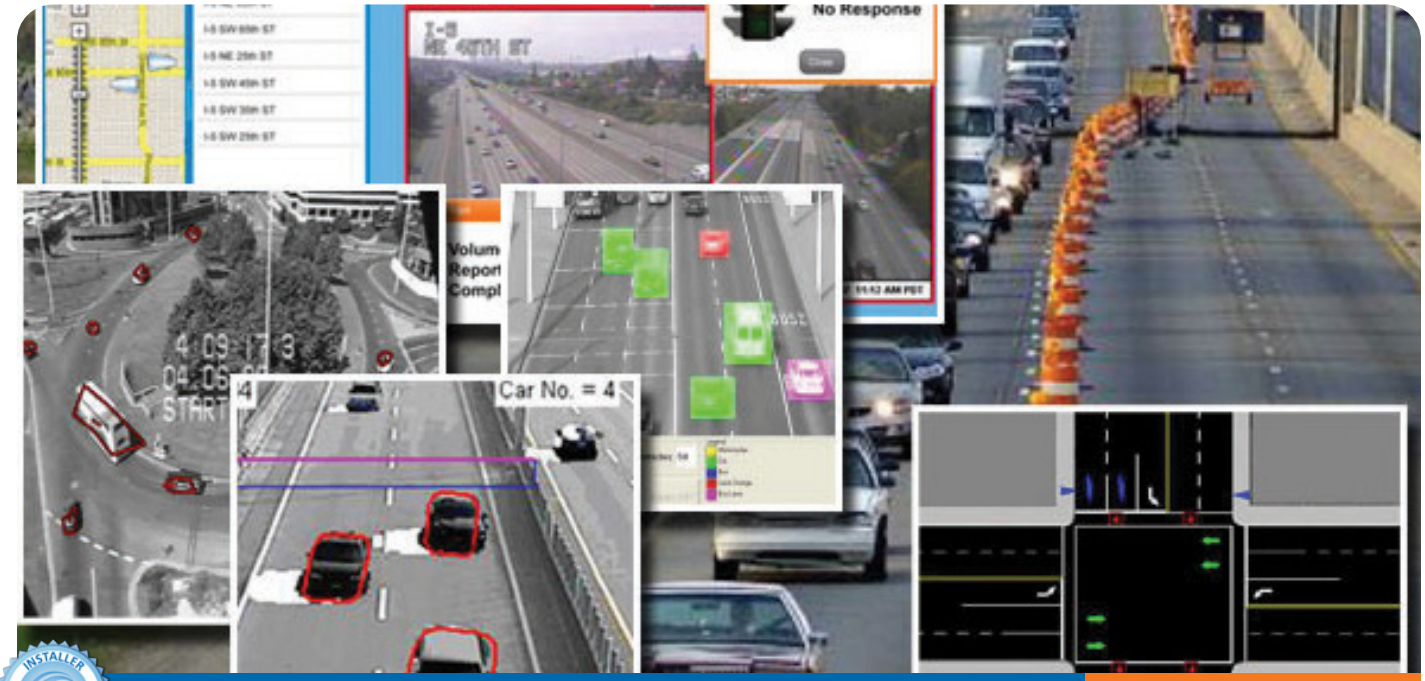
COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Wall-mount Segment Assembly (Pigtails)
- Testing Event Boxes with an OTDR

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-TEL	*Telecommunication Specialized Installer*	**$2,400**
TC-TEL	*TFS Certification TEL*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-ITS Traffic Systems Specialized Installer



LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

As the number of cars on the road increases, the need for traffic control grows exponentially. Fiber Optics are increasingly being used to tie together the enormously-complex networks that control the traffic lights, message signs, cameras and other traffic systems technology. This course teaches the essentials of splicing, testing and troubleshooting fiber optics systems, as well as the specialized Outside Plant knowledge required to work with Intelligent Transportation Systems (ITS) traffic systems.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optics for Traffic Systems: Traffic Management Overview; Dedicated-Short Range Wireless Networks; Mobile Telephony; Camera Recognition; Standards; Ethernet in ITS; Fiber Optic Cables in ITS; Radio Frequency (RF); Fiber optic Design; Factory Terminated Fiber Links; Fusion Splicing Options; CCTV Introduction; Dynamic Messaging; SCADA Basics; SCADA Architecture; SCADA Applications

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Lab 2 Wall-mount Segment Assembly (Pigtails)
- Lab 3 CCTV Setting up a CCTV Video Surveillance System

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-ITS	*Traffic Systems Specialized Installer*	**$2,400**
TC-ITS	*TFS Certification ITS*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-UTL Utilities Specialized Installer

LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This fiber optics training course is designed for those who specify, design, install, or maintain aerial and underground fiber optics systems in investor owned, REA, Co-operatives, and municipal power networks. Students will learn about latest fiber optic technology and equipment, as well as how to splice, terminate, test, and troubleshooting techniques for fiber optic based utility networks.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optics for Utilities: Telephone & CATV; Power Utilities; OSP Safety & Codes; OSP Installation Practices; Cabling Handling; Tension & Bend Radius; Span, Sag, and Tension; Figure-eighting Cables Splice Locations; Manholes and Vaults; Conduit and Ducts; ADSS (All Dielectric Self Supporting) & Optical Power Ground Wire (OPGW)

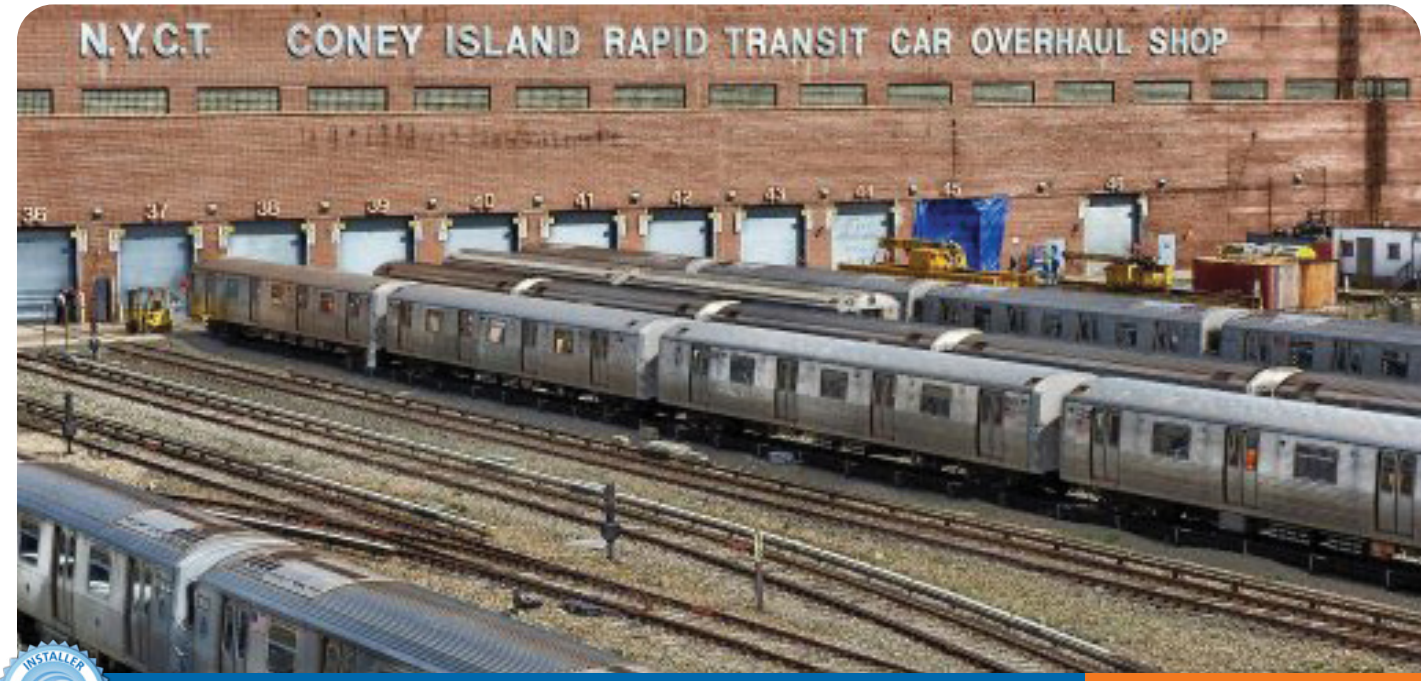
COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- OPGW Basic Cable Preparation (TL-09D)
- Runt Closure 2 cable in/out (Stubbed Ends)

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-UTL	*Utilities Specialized Installer*	**$2,400**
TC-UTL	*TFS Certification UTL*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-TSI Fiber Optic Transit Systems Specialized Installer



LEVEL 1 — PREREQUISITE: NONE | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This course is designed for those who design, install or maintain fiber optic systems in commercial buildings and other facilities. It identifies you as an installer who demonstrates a practical knowledge of fiber optic theory, codes, standards and practices widely accepted in commercial buildings and customer-owned outside environments. This course incorporates hands-on training of fiber terminations, cable preparations, installation practices and certification testing procedures. Students will learn skills applicable to all the functions required to safely and competently install advanced fiber communications in transit cabling deployments.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fundamentals; Theory; History; Performance Characteristics; System Components including Transmitters, Receivers
- Fiber Optic Installation Practices: Optical Networks; Techniques, Standards & Codes; Cable Types; Connectors; Splicing; Enclosures & Panels; Tools & Test Equipment; System Design & Loss Budgets: Equipment, Techniques & Applications
- Fiber Optic Transit: Video surveillance; SCADA Systems, Transit control applications; WiFi; CCTV

COURSE LABS HANDS-ON

- Cable Preparation, Cleaning and Cleaving
- Splice Closure: Prepare, Splice and Assemble
- Multimode Fiber LAN Link: Prepare, Splice and Assemble
- Fusion and Mechanical Splicing
- Perform Optical Loss Testing Using an OTDR
- Perform Loss and System Budget Calculations
- Splice-on Connector Installation
- Testing Event Boxes with an OTDR
- L-Jack Industrial Connector

PRICING COURSES & AVAILABLE CERTIFICATIONS

TR-TSI	*Fiber Optics for Traffic Systems*	**$2,400**
TC-TSI	*TFS Certification ITS*	**$150**
TC-CFI	*TFS Certification CFI*	**$150**

TR-OSP Outside Plant Technician

LEVEL 2 — PREREQUISITE: TR-CFI | **5-DAY COURSE** | **+16 HOURS** *of online instruction*

The fiber optic Outside Plant Technician course is similar to the Fiber Optic Technician (TR-FOT) course. It is designed for workers with fundamental fiber optic knowledge or installer certification. It focuses specifically on outside plant installations (OSP). OSP includes communications such as building to building or long haul telecommunications (including customer-owned OSP).

Emphasis is on single mode fiber optic installation and the associated international standards, theory, and practices. This specialized course is a must for any OSP professional. This course also includes an overview of FTTx ("Fiber to the x") applications (but there is another course specifically for FTTx specialists - TR-FTTX).

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Refresher on Fiber Optics: Fiber Optic Advantages and Applications, Terminology and History, The Fundamentals of Light Propagation, Scales of Measurement and the Spectrum
- Fiber Theory: Characteristics of Singlemode and Multimode, Manufacturing, Bandwidth and Linear effects
- Cables: Cable Types, Construction and Specifications, Cable Marking
- Selection Criteria
- Connectors and Terminations: Temporary and Permanent Connections, Connector Types, Mechanical and Environmental Considerations, Performance Specifications, Connector Loss Issues, Splicing Applications
- Splicing and Fusion and Mechanical: Fusion Splicing, Mechanical Splicing
- Enclosures and Panels: Panels, Distribution, Patch and Splice Types, Application Issues and Selection Criteria, Aerial and Burial Enclosures, Re-Entry and Expansion capabilities, Routing and Preparation
- Installation: Planning and Standards, Premise/LAN and Methods, Outside Plant and Methods, Aerial and Burial Techniques, Installation Tools and Equipment
- Test Equipment: Loss Testing Tools and Equipment, Standards and Methods, Return Loss, Bandwidth and Dispersion, OTDR Theory and Applications, Loss and System Budget Calculations
- Restoration and Maintenance: Tools and Equipment, Practical applications, Time Saving Techniques, Record Keeping and Documentation
- System Components and Design Issues: Transmitters and Receivers, Passive Optical Components, Couplers and Splitters, WDM and DWDM Issues
- System Design Exercise: Tools and Equipment, Practical Applications, Time Saving Techniques

COURSE LABS HANDS-ON

- Fusion Splicing
- Termination / Connectorization
- Cable Preparation
- OTDR Operation
- Optical Loss Testing

PRICING COURSES & CERTIFICATIONS

TR-OSP	*Outside Plant Technician*	**$2,500**
TC-OSP	*TFS Certification OSP*	**$150**
TC-ETA-OSP	*Certificate: ETA Outside Plant Installer*	**$150**

TR-FOT Fiber Optic Technician

LEVEL 2 — PREREQUISITE: TR-CFI | **5-DAY COURSE** | **+16 HOURS** *of online instruction*

The Fiber Optic Technician (TR-FOT) training is the next advanced level of our Fiber Optic Installer certification training. It builds upon the installer training and is designed to provide a real-life experience with solid classroom instruction using various labs and practical exercises designed around advanced installation, and testing techniques and procedures.

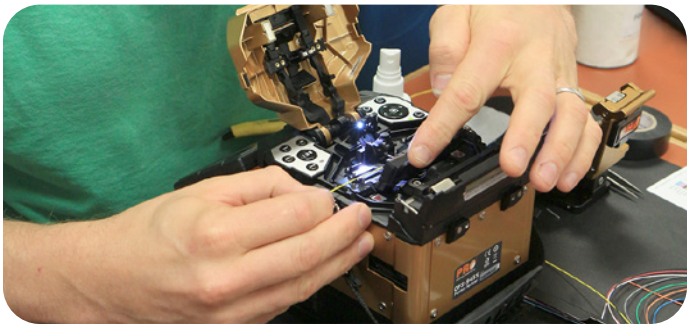
The Fiber Optic Technician training is a perfect complement for experienced fiber optic installers. Featured are technician level hands-on splicing and testing labs demonstrating advanced procedures and techniques. Students work with test equipment from several different manufacturers.

The Fiber Optic Technician certification is for professionals who are involved with designing, configuring, installing, testing, and maintaining fiber optic systems.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Fiber Optic Advantages and Applications, Terminology and History, The Fundamentals of Light Propagation, Scales of Measurement and the Spectrum, Characteristics of Singlemode and Multimode, Manufacturing, Bandwidth and Linear effects
- Cables: Cable Types, Construction and Specifications, Cable Marking, Selection Criteria
- Connectors and Terminations: Temporary and Permanent Connections, Connector Types, Mechanical and Environmental considerations, Performance Specifications, Connector Loss Issues, Splicing Applications
- Splicing – Fusion and Mechanical: Fusion Splicing, Cable Marking, Mechanical Splicing
- Enclosures and Panels: Panels, Distribution, Patch and Splice Types, Application Issues and Selection Criteria, Aerial and Burial Enclosures, Re-Entry and Expansion capabilities, Routing and Prep
- Installation: Planning and Standards, Premise/LAN Methods, Outside Plant Methods, Aerial and Burial Techniques, Installation Tools and Equipment
- Test Equipment: Loss Testing Tools and Equipment, Standards and Methods, Return Loss, Bandwidth and Dispersion, OTDR Theory and Applications, Loss and System Budget Calculations
- Restoration and Maintenance: Tools and Equipment, Practical Applications, Time Saving Techniques, Record Keeping and Documentation
- System Components and Design Issues: Transmitters and Receivers, Passive Optical Components, Couplers and Splitters, WDM and DWDM Issues
- Hands-on task required include: Building a complete fiber optic segment utilizing wall mount enclosures with fusion pigtails, quick connectors and mechanical splicing, Test the completed Fiber optic segment using an OLTS and OTDR, Review and Evaluate test results according to ETA and The Fiber School certification requirements



PRICING COURSES & CERTIFICATIONS

TR-FOT	*Fiber Optic Technician*	**$2,500**
TC-FOT	*TFS Certification FOT*	**$150**
TC-ETA-FOT	*Certificate: ETA Certified Technician*	**$150**

TR-ERC Emergency Restoration

LEVEL 2 — PREREQUISITE: TR-CFI | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

It is not a matter of if an outage will occur – It is a matter of when an outage will occur! Network outages can cost a company thousands of dollars for every minute that your network is down.

Having a recovery program in place is critical. As so is having a staff that has been trained and prepared to deal with the emergency when it occurs. The Fiber School has worked over the years with a number of network providers and with Adtell Integration, a leading contractor for emergency restoration services, to offer our Emergency Restoration training course. This two-day course emphasizes real-world hands-on troubleshooting techniques to quickly find the fault locations and then allows technicians to get hands-on experience in field restoration.

Emergency Restoration training emphasizes real-world, hands-on troubleshooting techniques to quickly find the fault locations and then allows technicians to gets hands-on experience in field restoration. This course is designed for fiber optic plant managers, technicians and contractors who desire an efficient fiber optic communication network.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

Using test gear in an emergency to locate the problem:

- Determine a Loss Budget
- What power generation shelter and lighting is suitable for a restoration
- How to prepare the damaged cable for an emergency restoration, and how to facilitate the permanent repair
- Mechanical splicing that is available, how to buy, store and use
- What closures work best for restoration
- How to make an emergency restoration kit
- Practical tips designed to cut down-time
- Safety Rules
- Creating a Response Plan

COURSE LABS HANDS-ON

- Build an Emergency Restoration Kit
- Test the Span Using an OTDR
- Perform Optical Loss Testing
- Measure Tx Output Power
- Measure Rx Output Power
- Develop a Hypothetical Outage Condition
- Define the Simulated Outage
- Measure Optical Distance
- Perform a Field Repair with a Restoration Kit
- Re-Test and Re-Document the System

PRICING COURSES & CERTIFICATIONS

TR-ERC	*Emergency Restoration*	**$1,300**
TC-ERC	*TFS Certification ERC*	**$150**

TR-OPGW Optical Power Ground Wire

LEVEL 2 — PREREQUISITE: TR-CFI | **2-DAY COURSE** | **+16 HOURS** *of online instruction*

This fiber optics training course is designed for those who specify, design, install, construct or maintain aerial Optical Power Ground wire systems in investor-owned, Electric Power Utilities, REAs, Co-operatives, and municipal power networks. Students will learn about the latest construction methods and procedures associated with OPGW fiber optic technology including cable and equipment, as well as how to splicing, termination, test, and troubleshooting fiber optic-based utility networks

Upon successful completion of these instructor-led lectures, Hands-on Labs, and exams, the student can achieve the TFS CMP-OPGW Certification.

ONLINE COURSE MATERIAL MUST BE COMPLETED BEFORE ATTENDING THE TRAINING.
Upon successful completion of the required on-line lectures and exams, the student will attend the scheduled in-person training sessions. Both parts are required to complete the course and be eligible for the certification.

COURSE LECTURES TOPICS INCLUDE

- Introduction: Precautions, Cable Installation, OPGW Installation Hardware, Stringing Procedures, Sagging Methods, Deadending and Clipping in, Spice Points, Anchoring Optical Units in the Splice Enclosure, Stringing and Handling, OPGW Diameters, Bending Radius
- Splicing: Fusion Splicing
- Enclosures: OPGW Aerial Enclosures, Fiber routing and Preparation
- Installation: Planning and Standards, OPGW Installation Methods, OPGW Hardware and Components, Installation Tools and Equipment
- Test Equipment: Testing Tools and Equipment

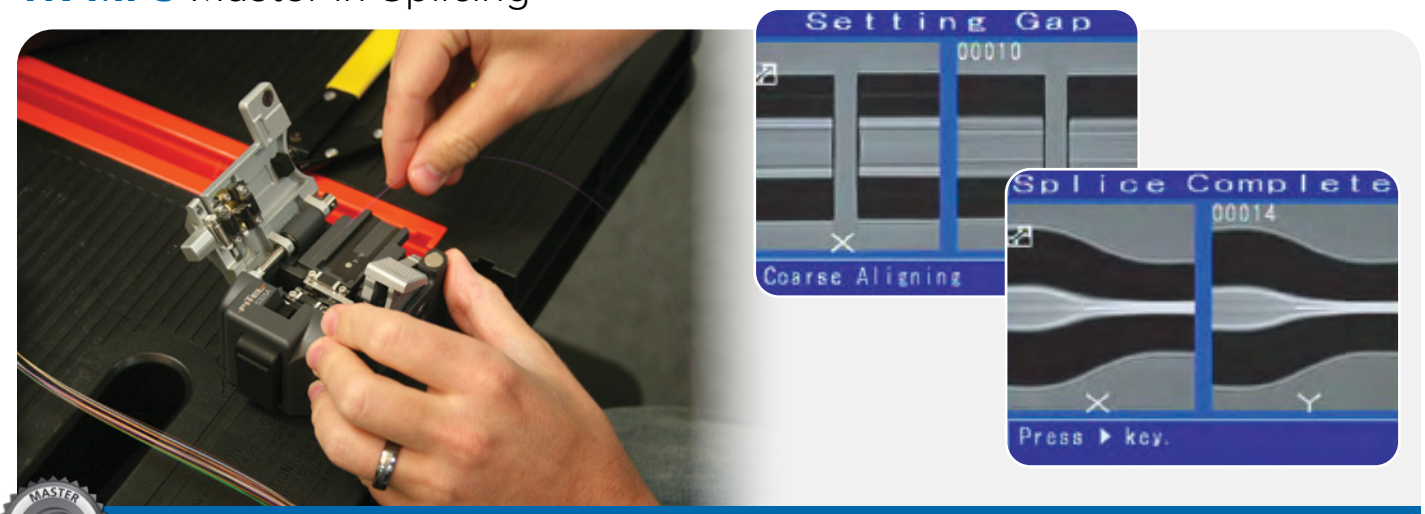
COURSE LABS HANDS-ON

- OPGW Cable preparation
- Comealong Installation
- Deadend Installation
- Mechanical Suspension Unit
- OPGW Suspension Installation
- OPGW Splice Closure: Prepare, splice and assemble a splice closure
- Perform optical loss testing using an OTDR

PRICING COURSES & CERTIFICATIONS

TR-OPGW	*Optical Power Ground Wire*	**$2,500**
TC-OPGW	*TFS Certification OPGW*	**$150**

TR-MFS Master in Splicing



LEVEL 3 — PREREQUISITE: LEVEL 2 **2-DAY COURSE**

The Master in Splicing program is the first of its kind in the telecommunications field. It is designed to provide an unmatched, real-life experience with solid classroom instruction using various labs designed around specific techniques. The Master in Splicing training is a perfect complement for experienced installers and technicians. Advanced hands-on design labs along with advanced fusing splicing techniques are featured in this course. Students work with several types of fusion splicers from at least two different manufacturers.

The Fiber School MASTER courses will expose you to the following equipment:

- Core alignment fusion splicers
- V-groove fusion splicers
- Mass/Ribbon fusion splicers
- Mechanical splices

COURSE LECTURES TOPICS INCLUDE

- Introduction to "Master in Splicing": Fiber Optic Advantages and Applications, Terminology, Methodology
- Designs: Infrastructure, Topologies, Survey, Checklist, Loss Budget – LAN Environments (Lab Exercise), Loss Budget – OSP Environments (Lab Exercise)
- Cable Preparations: Mid Span Access (Hands-on), Spider Fan out Kits (Hands-on), Splice Trays (Hands-on), Sheath Removal (Hands-on), Accessing Ribbon Cables (Hands-on), Sheath Removal Interlocked Armor (Hands-on)
- Optical Fiber Splicing Overview: Mechanical Splicing, Fusion Splicing, Mass splicing
- Cabling Hardware Overview: Optical Fiber Closures, Splice Closures, Distribution Center, Splice Trays, Hardware Labeling, Splice Configurations

COURSE LABS HANDS-ON

- Splicing – Mechanical (Hands-On): Types of Mechanical Splices, Fiber Preparation, Perform Mechanical Splicing
- Splicers – Fusion (Hands-On): Core Alignment versus Profile Alignment, Fiber Preparation, Cleaving Techniques, Operations, Maintenance, Splicing Tips
- Hands-On Exercises: Prepare, Splice and Assemble a Splice Closure, Prepare, Splice and Assemble a Multimode Fiber LAN Link, Perform Optical Loss Testing

PRICING COURSES & CERTIFICATIONS

TR-MFS	*Master In Splicing (Includes course materials)*	**$1,500**
TC-MFS	*TFS Certification MFS*	**$150**

TR-MFT Master in Testing

LEVEL 3 — PREREQUISITE: LEVEL 2 | 2-DAY COURSE

The Fiber School's Master in Testing program is the first of its kind in the telecommunications field. It is designed to provide an unmatched, real-life experience with solid classroom instruction. Using various labs designed around specific testing scenarios, the Master in Testing training is a perfect complement for experienced fiber optic installers and technicians. This course features advanced hands-on testing labs demonstrating advanced testing procedures and techniques. Students work with test equipment from several different manufacturers.

The Fiber School MASTER courses will expose you to the following equipment:

- Telco/Broadband OTDRs
- Handheld OTDRs
- Trace software
- Power meters
- Light sources
- Visual fault locators
- Fiber rings & launch boxes
- Fiber optic attenuators
- Fiber optic talk sets
- Video scopes
- Fiber cleavers

COURSE PREREQUISITES

The following knowledge or experience level is recommended: 3-5 years fiber optic installation experience or equivalent; Prior knowledge of basic testing equipment/procedures; Be a TFS professional certified Technician or Master in Splicing (desired); Be a TFS fiber technician, or equivalent industry certification.

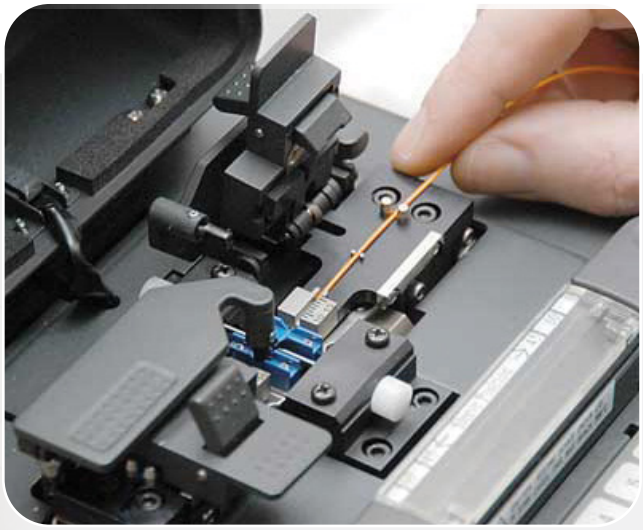
COURSE LECTURES TOPICS INCLUDE

- Introduction to "Master in Testing": Fiber Optic Testing Overview, Testing Equipment Overview
- Power Meter and Light Sources: Attenuation Test Procedures: One, Two and Three Jumper References
- Fiber Optic Certification Test Sets
- Optical Fiber Identifiers and Detectors: FTTx Active ONT Detector, Visual Fault Identifiers, Visual Fault Tracers
- The OTDR: Use and Operation of the Optical Time Domain Reflectometer (OTDR), Telco/Broadband OTDR, Handheld OTDR, Fiber Rings and Boxes, Trace Software
- Miscellaneous Equipment: Fiber Optic Attenuator, Fiber Optic Talk Sets, Video Scopes
- Testing in the LAN Environment (Presentation and Lab): Loss Budgets, Test Methods and Procedures, Documentation, Troubleshooting and Fault Locating Procedures
- Testing in the Telco Environment (Presentation and Lab): Loss Budgets, Test Methods and Procedures, Documentation, Troubleshooting and Fault Locating Procedures
- Testing in the CATV Environment (Presentation and Lab): Loss Budgets, Test methods and procedures, Documentation, Troubleshooting and fault locating procedures
- Testing in the CCTV Environment (Presentation and Lab): Loss Budgets, Test Methods and Procedures, Documentation, Troubleshooting and Fault Locating Procedures
- Testing in the FTTx Environment (Presentation and Lab): Loss Budgets, Test Methods and Procedures, Documentation, Troubleshooting and Fault Locating Procedures, Perform Optical Loss Testing
- Emergency Restoration Planning: Emergency Restoration Kits, System Design and Plan of Attack

PRICING COURSES & CERTIFICATIONS

TR-MFT	*Master In Testing (Includes course materials)*	**$1,500**
TC-MFT	*TFS Certification MFT*	**$150**

TR-MFOT Master Technician



LEVEL 3 — PREREQUISITE: LEVEL 2 **5-DAY COURSE**

The Master Fiber Optic Technician (TR-MFOT) training is the most comprehensive certification training available. It is our complete Fiber Optic Training; encompassing all aspects of our master splicing and testing programs into an intensive five-day certification experience that qualifies a Technician as a truly unique "Craftsman". It is designed to provide an unmatched, real-life experience with solid classroom instruction using various labs designed around splicing, and testing scenarios. The Master Fiber Optic Technician training is a perfect complement for experienced fiber optic installers and technicians. Featured are advanced hands-on splicing, testing labs and documentation exercises demonstrating advanced procedures and techniques. As outlined in the Master Splicing and Master Testing course agendas culminating in the extensive 5th day of OLTS and OTDR testing and documentation certification exercises. The Master Fiber Optic Technician certification is for professionals who are involved with configuring, installing, testing, and maintaining fiber optic systems.

COURSE PREREQUISITES

The following knowledge or experience level is recommended: 5 years fiber optic installation experience; Knowledge of splicing equipment and procedures; Knowledge of testing equipment and procedures; Be a TFS Certified Technician or OSP Installer or other equivalent (desired); Be an ETA Fiber Optic Technician or OSP Installer or other Industry equivalent (desired).

COURSE LECTURES TOPICS INCLUDE

- Introduction to "Master in Splicing": Fiber Optic Advantages and Applications, Terminology, Methodology
- Designs: Infrastructure, Topologies, Survey, Checklist, Loss Budget – LAN Environments (Lab Exercise), Loss Budget – OSP Environments
- Cable Preparations: Mid Span Access (Hands-on), Spider Fan out Kits (Hands-on), Splice Trays (Hands-on), Sheath Removal (Hands-on), Accessing Ribbon Cables (Hands-on), Sheath Removal Interlocked Armor (Hands-on)
- Optical Fiber Splicing Overview: Mechanical Splicing, Fusion Splicing, Mass splicing
- Cabling Hardware Overview: Optical Fiber Closures, Splice Closures, Splice Trays, Distribution Center, Hardware Labeling, Splice Configurations
- Splicing – Mechanical: Types of Mechanical Splices, Fiber Preparation (Hands-on), Perform Mechanical Splicing (Hands-on)
- Splicers – Fusion: Core Alignment versus Profile Alignment, Fiber Preparation (Hands-on), Cleaving Techniques (Hands-on), Operations (Hands-on), Maintenance (Hands-on), Splicing Tips (Hands-on)
- Hands-On Exercises: Prepare, Splice and Assemble a Splice Closure, Prepare, Splice and Assemble a Multimode Fiber LAN Link, Fusion and Mechanical Splicing, Perform Optical Loss Testing
- Introduction to "Master in Testing": Fiber Optic Testing Overview, Testing Equipment Overview
- Power Meter and Light Sources: Attenuation Test Procedures: One, Two and Three Jumper References
- Fiber Optic Certification Test Sets
- Optical Fiber Identifiers and Detectors: FTTx Active ONT Detector, Visual Fault Identifiers, Visual Fault Tracers
- The OTDR: Use and Operation of the Optical Time Domain Reflectometer (OTDR), Telco/Broadband OTDR, Handheld OTDR, Fiber Rings and Boxes, Trace Software
- Miscellaneous Equipment: Fiber Optic Attenuator, Fiber Optic Talk Sets, Video Scopes
- Testing in the LAN, Telco, CATCV, CCTV and FTTX Environments (Presentations and Labs): Loss Budgets, Test Methods and Procedures, Documentation, Troubleshooting and Fault Locating Procedures, Perform Optical Loss Testing

PRICING COURSES & CERTIFICATIONS

TR-MFOT	*Master Fiber Optic Technician (Includes course materials)*	**$3,500**
TC-MFOT	*TFS Certification MFOT*	**$150**

Paving your way to...

PROFESSIONAL

The Fiber School's guided courses utilize rigorous curriculums in conjunction with hands-on "real-life" experience in order to enhance students' knowledge and skills.

The fiber optics industry will keep expanding and so should you! Our **professional tracks** are the perfect money-saving formula for your continuing education. Whether you decide to take a "distance learning" online course, attend our main campus, take a regularly scheduled course in a city near you or even invite us to your town for on-site training... we'll be there for you.

Objectives

Our professional level programs certify that a student has passed at least two courses in a sequence and received instruction on techniques from the installer level up through the masters level.

The Fiber School certified professionals will have received a much more rigorous technical education than the minimum industry standard. Professional courses allow a student to become a master technician starting with little-to-no knowledge. Companies wishing to certify new personnel may wish to take advantage of these sequenced packages.

Course Offerings

The Fiber School proudly offers comprehensive professional tracks in **fiber optic splicing, fiber optic testing, outside plant splicing and outside plant testing.**

The Professional Advantage

The future of the fiber optic industry relies on highly-trained professionals to provide excellence in skills and services. The professional course pathway equips students with the everything from the very basics to advanced testing procedures, techniques and troubleshooting to prepare students for real-life situations.

START HERE

Fiber Optic Fundamentals (TR-FOF)	Fiber Optic Fundamentals (TR-FOF)	FUNDAMENTALS	Fiber Optic Fundamentals (TR-FOF)	Fiber Optic Fundamentals (TR-FOF)
Certified Fiber Optic Installer (TR-CFI)	Certified Fiber Optic Installer (TR-CFI)	INSTALLER	Certified Fiber Optic Installer (TR-CFI)	Certified Fiber Optic Installer (TR-CFI)
Fiber Optic Technician (TR-FOT)	Fiber Optic Technician (TR-FOT)	TECHNICIAN	Outside Plant (TR-OSP)	Outside Plant (TR-OSP)
Master Splicer (TR-MFS)	Master Tester (TR-MFT)	MASTER	Master Splicer (TR-MFS)	Master Tester (TR-MFT)
Hands-on Labs	Hands-on Labs		Hands-on Labs	Hands-on Labs
Professional Fiber Optic Splicer (TR-PFOS)	Professional Fiber Optic Tester (TR-PFOT)	PROFESSIONAL	Professional Outside Plant Splicer (TR-POPS)	Professional Outside Plant Tester (TR-POPT)

PROFESSIONAL TRACKS

TR-PFOS Professional Fiber Optic Splicer

LEVEL 0-3 — PREREQUISITE: NONE | **9-DAY COURSE** | **+16 HOURS** *of online instruction*

This specialty track is designed for the fiber optics professional who wishes to specialize in the **splicing of fiber optic cable, with an emphasis on the indoor environment.** The person who completes this track will demonstrate a high proficiency in splicing fiber, proper slack management in confined spaces, and the entry of both wall-mounted and rack mounted enclosures.

This track begins with the Certified Fiber Installer (TR-CFI) course. This is the core curriculum for all of our training. After the CFI, the next step is the Fiber Optic Technician (TR-FOT) course.

After the required field experience credits have been completed, the student may then apply to enter the Master in Splicing (TR-MFS) course, where the student will receive track specific instruction, geared toward their current work needs.

Following the completion of remaining field experience credits, the student may apply for the one-week extensive training. As a fiber splicer working in the indoor environment, the student will be required to perform a variety of splicing and cable entry tasks. Successful completion of these exercises will demonstrate to the evaluators that the student meets the criteria for the award of the **Professional Fiber Optic Splicer Certification**.

- Fiber Optic Fundamentals (TR-FOF)
- Certified Fiber Optic Installer (TR-CFI)
- Fiber Optic Technician (TR-FOT)
- Master Splicer (TR-MFS)
- Hands-on Lab

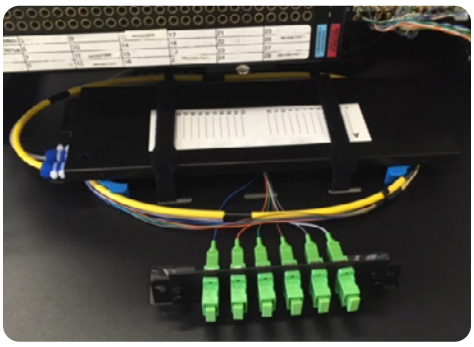
TR-FOF Fiber Optic Fundamentals:
This course provides students with a practical knowledge and understanding of the latest installation, splicing, termination, and testing techniques, achieving the knowledge and competency to design, oversee, direct and maintain fiber optic cabling systems.

TR-CFI Certified Fiber Optic Installer:
This course teaches students to lay out, install or maintain fiber optic cabling systems. Certification identifies you as an installer who can demonstrate a practical knowledge of the fiber optic theory, codes standards and practices.

TR-FOT Certified Fiber Optic Technician:
This course utilizes technician-level, hands-on splicing and testing labs to demonstrate advanced procedures and techniques. TR-FOT is perfect for professionals who are involved with designing, configuring, installing, testing and maintaining fiber optic systems.

TR-MFS Master in Splicing:
This course features advanced hands-on testing labs demonstrating advanced splicing procedures and techniques. Students will also learn industry-standard splicing techniques and industry "best practices", becoming a splicing specialist.

TR-PFOS-LAB 4 Day Lab and Examination:
The 4-day Professional Fiber Optic Splicer "practicum" has proven to be immensely popular with our students. It's an excellent chance for students to discover any gaps in their knowledge before taking the certification exam, while also providing a unique opportunity for students to ask the instructor questions while receiving hands-on, "real-world" experience.



PRICING INDIVIDUAL COURSES & CERTIFICATIONS

TR-FOF	*Fiber Optic Fundamentals*	**$600**
TR-CFI	*Certified Fiber Optic Installer*	**$1,500**
TR-FOT	*Certified Fiber Optic Technician*	**$2,500**
TR-MFS	*Master in Splicing*	**$1,500**
TR-PFOS-LAB	*4 Day Hands-on Lab and Exam*	**$2,500**
	Total:	**$8,600**

TRACK PACKAGE PRICING

TR-PFOS	*Professional Fiber Optic Splicer*	**$7,000**
	Savings:	**$1,600**

TR-PFOT Professional Fiber Optic Tester

LEVEL 0-3 — PREREQUISITE: NONE | **9-DAY COURSE** | **+16 HOURS** *of online instruction*

This specialty track is designed for the fiber optics professional who wishes to specialize in the **testing of fiber optic cable, with an emphasis on the indoor environment**. The person who completes this track will demonstrate a high proficiency in fiber testing procedures and techniques as it applies to multi-mode fiber within confined spaces, as well as wall-mounted and rack mounted enclosures.

This track begins with the Certified Fiber Installer (TR-CFI) course. This is the core curriculum for all of our training. After the CFI, the next step is the Fiber Optic Technician (TR-FOT) course.

After the required field experience credits have been completed, the student may then apply to enter the Master in Testing (TR-MFT) course, where the student will receive track specific instruction, geared toward their current work needs.

Following the completion of remaining field experience credits, the student may apply for the one-week extensive training. As a fiber tester working in the indoor environment, the student will be required to perform a variety of testing and troubleshooting tasks. Successful completion of these exercises will demonstrate to the evaluators that the student meets the criteria for the award of the **Professional Fiber Optic Tester Certification**.

- Fiber Optic Fundamentals (TR-FOF)
- Certified Fiber Optic Installer (TR-CFI)
- Fiber Optic Technician (TR-FOT)
- Master Tester (TR-MFT)
- Hands-on Lab

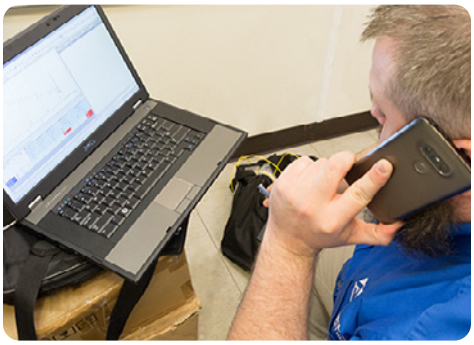
TR-FOF Fiber Optic Fundamentals:
This course provides students with a practical knowledge and understanding of the latest installation, splicing, termination, and testing techniques, achieving the knowledge and competency to design, oversee, direct and maintain fiber optic cabling systems.

TR-CFI Certified Fiber Optic Installer:
This course teaches students to lay out, install or maintain fiber optic cabling systems. Certification identifies you as an installer who can demonstrate a practical knowledge of the fiber optic theory, codes standards and practices.

TR-FOT Certified Fiber Optic Technician:
This course utilizes technician-level, hands-on splicing and testing labs to demonstrate advanced procedures and techniques. TR-FOT is perfect for professionals who are involved with designing, configuring, installing, testing and maintaining fiber optic systems.

TR-MFT Master in Testing:
This course features hands-on testing labs demonstrating advanced testing procedures and industry-standard fiber characterization techniques. Students will become testing specialists who are better able to troubleshoot network problems, analyze traces, and calibrate different types of OTDRs.

TR-PFOT-LAB 4 Day Lab and Examination:
The 4-day Professional Fiber Optic Splicer "practicum" has proven to be immensely popular with our students. It's an excellent chance for students to discover any gaps in their knowledge before taking the certification exam, while also providing a unique opportunity for students to ask the instructor questions while receiving hands-on, "real-world" experience.



PRICING INDIVIDUAL COURSES & CERTIFICATIONS

TR-FOF	*Fiber Optic Fundamentals*	**$600**
TR-CFI	*Certified Fiber Optic Installer*	**$1,500**
TR-FOT	*Certified Fiber Optic Technician*	**$2,500**
TR-MFT	*Masters in Testing*	**$1,500**
TR-PFOT-LAB	*4 Day Hands-on Lab and Exam*	**$2,500**
	Total:	**$8,600**

PACKAGE PRICING

TR-PFOT	*Professional Fiber Optic Tester*	**$7,000**
	Savings:	**$1,600**

TR-POPS Professional Outside Plant Splicer

LEVEL 0-3 — PREREQUISITE: NONE | **9-DAY COURSE** | **+16 HOURS** *of online instruction*

This specialty track is designed for the fiber optics professional who wishes to specialize in the **splicing of fiber optic cable, with an emphasis on the outside environment**. The person who completes this track will demonstrate a high proficiency in splicing fiber, proper slack management in aerial and underground location, and the entry of a variety of outside rated fiber splice enclosures.

This track begins with the Certified Fiber Installer (TR-CFI) course. This is the core curriculum for all of our training. After the CFI, the next step is the Fiber Optic Technician (TR-FOT) course.

After the required field experience credits have been completed, the student may then apply to enter the Master in Splicing (TR-MFS) course, where the student will receive track specific instruction, geared toward their current work needs.

Following the completion of remaining field experience credits, the student may apply for the one-week extensive training. As a splicer working in the outside plant, the student will be required to perform a variety of splicing and enclosure preparation and entry tasks. Successful completion of these exercises will demonstrate to the evaluators that the student meets the criteria for the award of the **Professional Outside Plant Splicer Certification**.

- Fiber Optic Fundamentals (TR-FOF)
- Certified Fiber Optic Installer (TR-CFI)
- Outside Plant Splicer (TR-OSP)
- Master Splicer (TR-MFS)
- Hands-on Lab

TR-FOF Fiber Optic Fundamentals:
This course provides students with a practical knowledge and understanding of the latest installation, splicing, termination, and testing techniques, achieving the knowledge and competency to design, oversee, direct and maintain fiber optic cabling systems.

TR-CFI Certified Fiber Optic Installer:
This course teaches students to lay out, install or maintain fiber optic cabling systems. Certification identifies you as an installer who can demonstrate a practical knowledge of the fiber optic theory, codes standards and practices.

TR-OSP Certified Outside Plant Technician:
TR-OSP focuses extensively on Outside Plant installations (OSP). Outside Plant often includes communication infrastructure between buildings, as well as long haul telecommunications (including customer-owned OSP). This course also includes an overview of FTTx (Fiber To The "X") applications.

TR-MFS Master in Splicing:
This course features advanced hands-on testing labs demonstrating advanced splicing procedures and techniques. Students will also learn industry-standard splicing techniques and industry "best practices", becoming a splicing specialist.

TR-POPS-LAB 4 Day Lab and Examination:
The 4-day Professional Outside Plant Splicer "practicum" has proven to be immensely popular with our students. It's an excellent chance for students to discover any gaps in their knowledge before taking the certification exam, while also providing a unique opportunity for students to ask the instructor questions while receiving hands-on, "real-world" experience.

PRICING INDIVIDUAL COURSES & CERTIFICATIONS

TR-FOF	*Fiber Optic Fundamentals*	**$600**
TR-CFI	*Certified Fiber Optic Installer*	**$1,500**
TR-OSP	*Outside Plant Splicer*	**$2,500**
TR-MFS	*Masters in Splicing*	**$1,500**
TR-POPS-LAB	*4 Day Hands-on Lab and Exam*	**$2,500**
	Total:	**$8,600**

PACKAGE PRICING

TR-POPS	*Professional Outside Plant Splicer*	**$7,000**
	Savings:	**$1,600**

TR-POPT Professional Outside Plant Tester

LEVEL 0-3 — PREREQUISITE: NONE | **9-DAY COURSE** | **+16 HOURS** *of online instruction*

This specialty track is designed for the fiber optics professional who wishes to specialize in the **testing of fiber optic cable, with an emphasis on the outside environment**. The person who completes this track will demonstrate a high proficiency in fiber testing procedures and techniques as it applies to single-mode fiber over long-haul links, wide area networks, and point-to-point applications.

This track begins with the Certified Fiber Installer (TR-CFI) course. This is the core curriculum for all of our training. After the CFI, the next step is the Fiber Optic Technician (TR-FOT) course.

After the required field experience credits have been completed, the student may then apply to enter the Master in Testing (TR-MFT) course, where the student will receive track specific instruction, geared toward their current work needs.

Following the completion of remaining field experience credits, the student may apply for the one-week extensive training. As a tester working in the outside plant, the student will be required to perform a variety of testing, evaluation, and troubleshooting tasks. Successful completion of these exercises will demonstrate to the evaluators that the student meets the criteria for the award of the **Professional Outside Plant Tester Certification**.

- Fiber Optic Fundamentals (TR-FOF)
- Certified Fiber Optic Installer (TR-CFI)
- Outside Plant Splicer (TR-OSP)
- Master Tester (TR-MFT)
- Hands-on Lab

TR-FOF Fiber Optic Fundamentals:
This course provides students with a practical knowledge and understanding of the latest installation, splicing, termination, and testing techniques, achieving the knowledge and competency to design, oversee, direct and maintain fiber optic cabling systems.

TR-CFI Certified Fiber Optic Installer:
This course teaches students to lay out, install or maintain fiber optic cabling systems. Certification identifies you as an installer who can demonstrate a practical knowledge of the fiber optic theory, codes standards and practices.

TR-OSP Certified Outside Plant Technician:
TR-OSP focuses extensively on Outside Plant installations (OSP). Outside Plant often includes communication infrastructure between buildings, as well as long haul telecommunications (including customer-owned OSP). This course also includes an overview of FTTx (Fiber To The "X") applications.

TR-MFT Master in Testing:
This course features hands-on testing labs demonstrating advanced testing procedures and industry-standard fiber characterization techniques. Students will become testing specialists who are better able to troubleshoot network problems, analyze traces, and calibrate different types of OTDRs.

TR-POPT-LAB 4 Day Lab and Examination:
The 4-day Professional Outside Plant Tester "practicum" has proven to be immensely popular with our students. It's an excellent chance for students to discover any gaps in their knowledge before taking the certification exam, while also providing a unique opportunity for students to ask the instructor questions while receiving hands-on, "real-world" experience.

PRICING INDIVIDUAL COURSES & CERTIFICATIONS

TR-FOF	*Fiber Optic Fundamentals*	**$600**
TR-CFI	*Certified Fiber Optic Installer*	**$1,500**
TR-OSP	*Certified Outside Plant Technician*	**$2,500**
TR-MFT	*Masters in Testing*	**$1,500**
TR-POPT-LAB	*4 Day Hands-on Lab and Exam*	**$2,500**
	Total:	**$8,600**

PACKAGE PRICING

TR-POPT	*Professional Outside Plant Tester*	**$7,000**
	Savings:	**$1,600**

TR-FCB Fiber Characterization Basics

LEVEL 3 — PREREQUISITE: MASTER IN TESTING | **ONLINE SELF-PACED COURSE** | **8 HOURS** of online instruction

This fundamental online course will provide students with an introduction to fiber characterization and allow students to effectively communicate and interpret issues found during testing of optical infrastructure. Students will learn about the theory behind PMD, CD and attenuation profiling, and how to interpret the results obtained during testing.

Target Audience

This course is designed for network engineers, system managers, application engineers, designers, and supervisors.

This course Includes:

- Examine tests that are required for fiber characterization
- Transmission limits as a function of bit rate and application
- The effects of chromatic dispersion and polarization mode dispersion on high speed signals such as 10G, 40G, & 100G
- OTDR theory and bi-directional splice characterization
- Learn about ORL and the consequences of high ORL

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: What is Fiber Characterization?, Why is it needed?, Legacy Networks and Today's Networks
- Fiber Optic Basic Review: Transmission Basics, Light Propagation, Causes of Optical Loss, Types of Fiber
- Inspection and Cleaning of Fibers: Inspection Tools, Proper Cleaning Practices, Inspection Assessment
- End to End Loss: Connector Loss, Splice Loss, Power Budget Calculations, Test Methodologies, OTLS Functionality
- Optical Return Loss: Consequences of High ORL, ORL Limits, ORL Test Tools, ORL Testing
- OTDR: How an OTDR Works, Reflectance, Dead Zones, Setting up an OTDR, Manual Measurements
- Chromatic Dispersion: Causes of Chromatic Dispersion, Limits of Chromatic Dispersion, Chromatic Dispersion Testing, Compensation
- Polarization Mode Dispersion: Causes of PMD, Mode Coupling, PMD Limits, PMD Testing

PRICING COURSES & CERTIFICATIONS

TR-FCB	*Fiber Characterization Basics (Includes course materials)*	**$900**
TC-FCB	*TFS Certification FCB*	**$150**

TR-FCT Fiber Characterization Technician

LEVEL 3 — PREREQUISITE: MASTER IN TESTING **3-DAY COURSE**

This three-day course will provide you with all the knowledge and requirements that are needed to effectively characterize your optical infrastructure. You will learn about all the requirements for engineering and for qualifying the optical fiber links that utilize specific bit rates in regards to both metro and long haul spans.

After taking this course, students will have a detailed understanding of advanced OTDR configuration, cause and effect of trace events, and other advanced trace analysis techniques including bi-directional splice characterization and optical return loss testing.

This course Includes:

- Tests and equipment that are required for fiber characterization
- Transmission limits as a function of bit rate and application
- The effects of Chromatic Dispersion (CD) and Polarization Mode Dispersion (PMD) on high speed signals such as 10G, 40G, and 100G
- OTDR theory and bi-directional splice characterization and splice reports
- Optical return loss (ORL) testing & the effects of high ORL
- How to measure CD and PMD
- Conduct all tests required for fiber characterization
- Test one complete span and compile all test data into a comprehensive report
- Use an OLTS, OTDR, CD, and PMD tester

COURSE PREREQUISITES

Although not required, Fiber Characterization Basics (TR-FCB) is the recommended online prerequisite for this course.

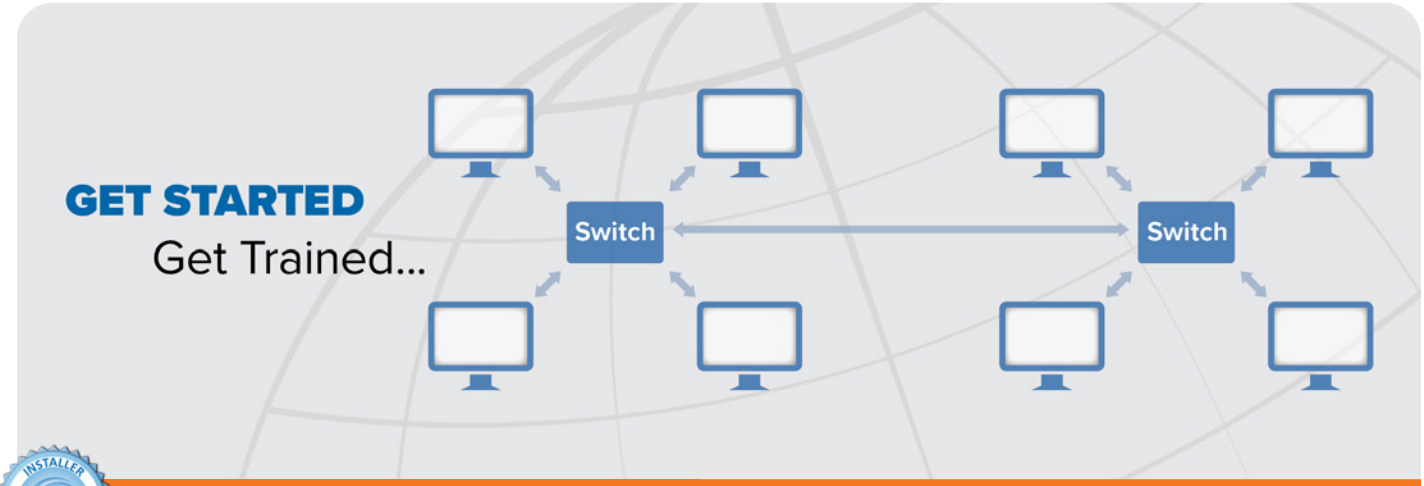
COURSE LECTURES TOPICS INCLUDE

- Intro to Fiber Characterization: Fiber Characterization and why it's needed, Legacy Networks and Today's Networks
- Fiber Optic Basic Review: Transmission Basics, Light Propagation, Causes of Optical Loss, Types of Fiber
- Inspection and Cleaning of Fibers: Inspection Tools, Proper Cleaning Practices, Inspection Assessment
- End to End Loss: Connector Loss, Splice Loss, Power Budget Calculations, Test Methodologies, OTLS Functionality
- Optical Return Loss: Consequences of High ORL, ORL Limits, ORL Test Tools, ORL Testing
- OTDR: How an OTDR Works, Reflectance, Dead Zones, Setting up the OTDR, Manual Measurements
- Chromatic Dispersion: Causes and limits of Chromatic Dispersion, Chromatic Dispersion Testing, Compensation
- Polarization Mode Dispersion: Causes of PMD, Mode Coupling, PMD Limits, PMD Testing, Isolating High PMD Areas
- Bi-directional Trace Analysis: Post Analysis Software, Creating Templates, Applying Templates, Generating Splice Reports
- Reports: Transferring Data, Compiling Data, Generate Report

PRICING COURSES & CERTIFICATIONS

TR-FCT	*Fiber Characterization Training (Includes course materials)*	**$4,000**
TC-FCT	*TFS Certification FCT*	**$150**

TR-PWSF Premise Wiring Systems Fundamentals



LEVEL 1 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **8 HOURS** of online instruction

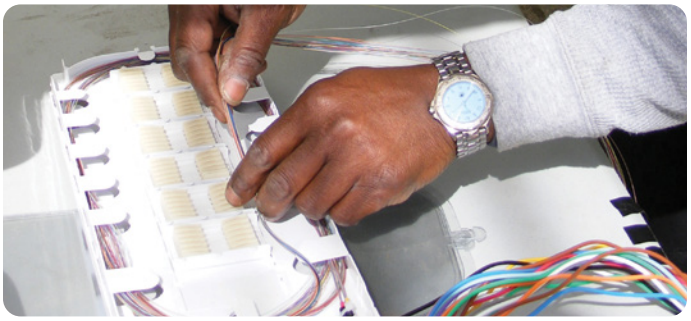
Premise Wiring Systems Fundamentals is an online course, designed for new or experienced personnel who desire a fundamental knowledge of copper and fiber optic theory, codes, standards and practices widely accepted in commercial buildings and customer-owned outside plant facilities.

Target Audience

This online course is excellent for those who install, supervise, design and/or oversee the installation of copper and fiber premise wiring systems in commercial buildings. This course is also recommended for IT professionals or facility managers who have a need to oversee telecommunication projects.

This course will allow students to:

- Understand the telecommunication-wiring standards for high performance category rated copper cabling.
- Understand a basic building physical topology (permanent link and channel).
- Know how to analyze the performance parameters for copper and fiber optic cabling systems.
- Know the performance specifications for the high-performance Twisted Pair Media.
- Understand Premise Wiring Test Equipment.
- Understand distance limitations, attenuation, near-end cross talk, wire mapping and how to test these measurable electrical properties of copper and fiber media.
- Understand the current Telecommunication Commercial Building Wiring Standards (EIA/TIA).



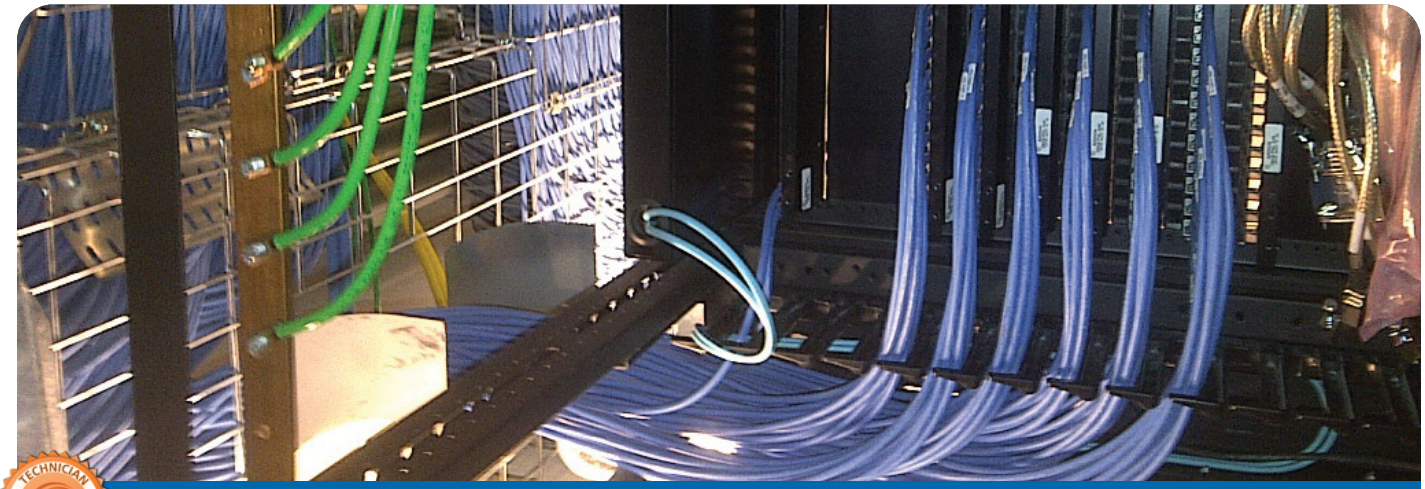
COURSE LECTURES TOPICS INCLUDE

- Introduction - Course Objectives: The Telecommunications Standards, EIA/TIA 568B Series, EIA/TIA 569A, EIA/TIA 606A, EIA/TIA 607, The National Electric Code
- The Topologies: Topologies (Physical), Topologies (LAN Basics), The Premise Wiring System
- Unshielded Twisted Pair (UTP)
- Screened Twisted Pair (ScTP)
- Shielded Twisted Pair (STP)
- Coaxial Cable
- Fiber Optic Fundamentals
- Cable Applications: Backbone, Horizontal, Work Area, Media Types (Cables), Distance Limitations
- Media Terminations and Components: Copper and Fiber Optic Connections
- Patch Panels: Cable Management
- Installation Practice: Horizontal Pathways, Backbone Pathways, Work Area, Fiber Optic Practices, Miscellaneous Practices, Grounding Basics
- Testing and Equipment: Test Equipment, Electrical Parameters, Optical Parameters, Permanent Link Testing
- Specification Process: Reading Plans and Specs

PRICING COURSES & CERTIFICATIONS

TR-PWSF	*Premise Wiring Systems Fundamentals (Includes course materials)*	**$600**
TC-PWSF	*TFS Certification PWSF*	**$150**

TR-PWST Premise Wiring Systems Technician



LEVEL 2 — PREREQUISITE: TR-PWSF **4-DAY COURSE**

The Premise Wiring Systems Technician training expands a student's installer training and encompasses a higher knowledge level of copper and fiber optic cabling used in commercial buildings and customer-owned outside plant environments (Campus).

This course incorporates hands-on labs including multi-vendor copper and fiber terminations, and expanded fiber optic splicing and testing labs. Students will learn skills applicable to all functions required to safely and competently install advanced copper and fiber communications cabling in the premise environment.

As the follow-up course to Premise Wiring Installer (TR-PWSI), this course will give an advanced level of understanding of how to assemble, wire, and test various commercial building cabling systems.

This course will allow students to:

- Understand the EIA/TIA standards for category 5e, 6, 6A & 7
- Understand the EIA/TIA standards for laser optimized fiber optic cabling
- Know the performance specifications for the high performance Twisted Pair Media
- Understand Premise Wiring Test Equipment
- Understand distance limitations, attenuation, near-end crosstalk, wire mapping and how to test the performance of copper and fiber media
- Understand the logical and physical organization of premise systems, the products and test equipment needed to install and maintain them
- Demonstrate basic skills needed to assemble, wire, and test various cabling systems including new advanced cabling systems by participating in hands-on lab exercises including fusion splicing and OTDR testing.

COURSE LECTURES TOPICS INCLUDE

- Introduction: Course Objectives
- Ethernet Fundamentals
- Wireless Networking
- Power over Ethernet
- Testing Copper Cables
- Testing Optical Fiber
- Voice over IP
- CCTV Fundamentals
- Telecommunications Standards: EIA/TIA 568B Series, EIA/TIA 569A, EIA/TIA 606A, EIA/TIA 607, The National Electric Code
- Cable Specifications: Media, Unshielded Twisted Pair, Screened Twisted Pair (ScTP), Shielded Twisted Pair (STP), Category 5e, 6, 7 and laser optimized fiber
- Cable Applications: Backbone, Horizontal, Work Area, Media Types (Cables), Distance Limitations
- Review: Media Terminations and Components, Copper and Fiber Optic, Connections, Patch Panels, Cable Management
- Installation Practice: Horizontal Pathways, Backbone Pathways, Work Area, Fiber Optic Practices, Grounding Basics
- Testing and Equipment: Test Equipment, Electrical Parameters, Optical Parameters, Permanent Link Testing, Channel Testing

COURSE LABS HANDS-ON

- Set up and install: A basic CCTV system
- Build: Copper, fiber and coax links using Power Over Ethernet
- Copper Testing: Certification Testing, Permanent Link Testing, Channel Testing
- Labs: Pre-polished no epoxy terminations & pigtail splicing
- Fiber Testing: OLS Optical Loss Test Set, Test a Fiber Optic Link
- Fiber Testing: Tier 1 & Tier Link testing

PRICING COURSES & CERTIFICATIONS

TR-PWST	*Premise Wiring Systems Technician (Includes course materials)*	**$2,500**
TC-PWST	*TFS Certification PWST*	**$150**

TR-WNF Wireless Network Fundamentals

LEVEL 1 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **8 HOURS** of online instruction

This online course is designed to give students a firm understanding of radio frequency theory, 802.11 standards, WLAN topologies, basic antenna theory and an introduction to WLAN security. Presentation material will explore WLAN applications in specific markets, WLAN topologies and design concerns, essential equipment, AP configuration, & site survey techniques.

Objectives

Wireless Network Fundamentals training will give students a good foundation in both wireless networking techniques and equipment.

This course covers:

- Understand when to use wireless networks
- Know how to secure wireless networks
- Understand the differences between enterprise grade and consumer grade wireless equipment
- Know how to properly troubleshoot and test wireless networks

Target Audience

This course is designed for network installers, building managers, small campus technology staff, IT personnel and anyone else with an interest in enterprise level wireless networking. No prior experience is necessary.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Wireless Networking
- Understanding Enterprise Grade Wi-Fi Networks
- Designing and Deploying Wireless: Antennas, Devices, Security
- Basic Wireless Router and Client Setup
- Common Administrative Tasks
- 802.11 Troubleshooting
- Site Surveys and RF Signal Measurements

Ruckus ZoneFlex 7962
Dual-band 802.11n Enterprise-Grade Access Point

PRICING COURSES & CERTIFICATIONS

TR-WNF	*Wireless Network Fundamentals (Includes course materials)*	**$300**
TC-WNF	*TFS Certification WNF*	**$150**

To register call: 877-529-9114

TR-WIT Wireless Network Installation & Testing

LEVEL 1 — PREREQUISITE: TR-WNF **2-DAY COURSE**

This course is designed to give students a firm understanding of WLAN security. Hands-on access point and client adaptor labs provide attendees with experience setting up and securing a wireless LAN. Presentation material will explore WLAN design concerns, essential equipment, AP configuration, and site survey techniques.

Objectives

As the follow-up course to Wireless Network Fundamentals (TR-WNF), this course assumes the student already knows how to set up a basic enterprise level wireless network. This course will teach students how to properly configure and secure a network against intrusion, vandalism, and abuse.

This course includes:

- Security: 802.11 Security, Networking Tips, Authentication and Encryption
- Understanding Advanced Wireless Network Settings
- Address Translation, Firewalling and MAC Filtering
- Configuring WPA
- Intrusion Detection
- Physical Security of Wireless Assets
- Planning for Infrastructure Improvements
- IPv4 Migration
- Public Wireless Hotspot Setup
- Using DNS for a “For-pay” Wireless Connection
- Antenna Placement

Target Audience

This course is designed for network installers, building managers, small campus technology staff, IT personnel and anyone else with an interest in enterprise level wireless networking. Students should be familiar with enterprise level network hardware and the installation of wireless networks prior to taking this course. The Wireless Network Fundamentals course is a recommended prerequisite.

COURSE LECTURES TOPICS INCLUDE

- Advanced Wireless Networking
- Planning for Network Security
- Securing Wireless Router and Clients
- Advanced Administrative Tasks
- Intrusion Detection Techniques

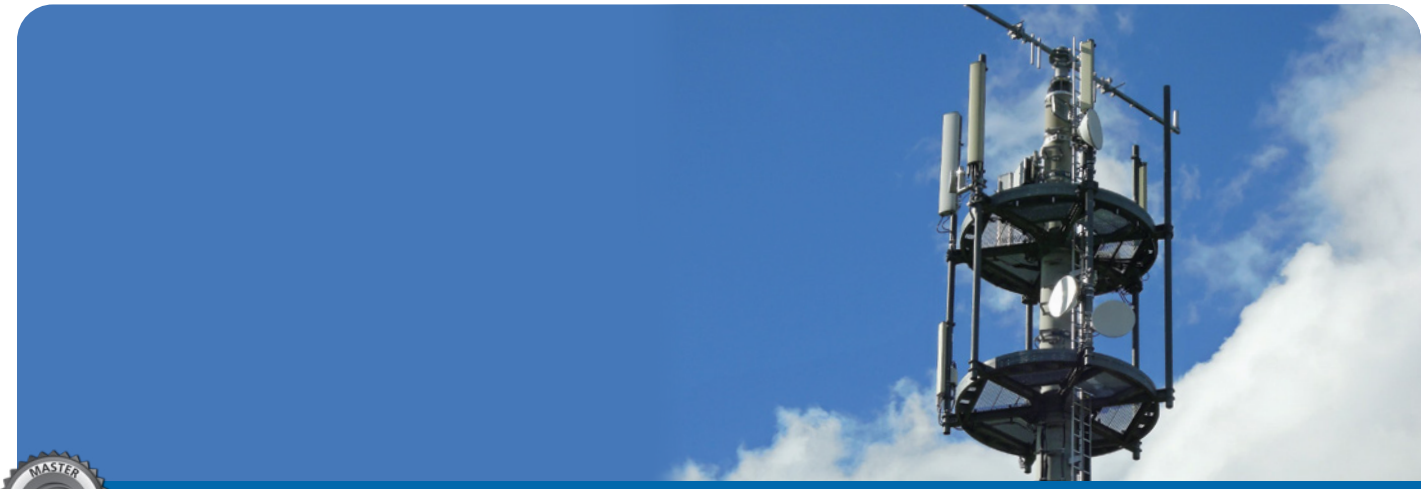
COURSE LABS HANDS-ON

- Create a wireless network
- Test a Wireless LAN (WLAN) by sharing Windows files
- Install and configure wireless network adapters, access points and wireless LAN antennas
- Connect to an Integrated Wireless Router
- Perform management, security and custom configurations
- Perform basic site survey
- Use diagnostic tools
- Perform internet and wireless connectivity troubleshooting
- Create Firewall Filter Rules to restrict access to undesirable websites
- Restrict access to certain MAC addresses

PRICING COURSES & CERTIFICATIONS

TR-WIT	*Wireless Network Installation & Testing (Includes course materials)*	**$1,500**
TC-WIT	*TFS Certification WIT*	**$150**

TR-LTEBT Long Term Evolution (LTE) Basics



LEVEL 3 — PREREQUISITE: NONE **2-DAY COURSE**

LTE Basics, delivers true mobile broadband for the masses with a superior user experience. LTE provides improved performance, lower total cost of ownership and enables a new era of personalized services and covers the technical details of the next-generation network beyond 3G. This two day course provides an overview of LTE from both application and technical aspects. It gives an overview of the LTE/E-UTRAN network architecture, the underlying technologies, and call setup procedures.

Objectives

LTE (Long Term Evolution) covers the technical details of the next-generation network beyond 3G. This course includes:

- List LTE System architecture
- Radio access network
- LTE air interface details
- Underlying technologies of LTE: OFDMA/SC-FDMA and MIMO
- LTE applications, security, SLA and QoS
- Mobility in LTE
- LTE RF and backhaul planning

Target Audience

This course is designed for network installers, building managers, small campus technology staff, IT personnel and anyone else with an interest in the technical overview of the LTE access network.

COURSE LECTURES TOPICS INCLUDE

- Overview of LTE, HSDPA and HSUPA
- UMTS LTE Networks
- HSPA Evolution in Release 7/8 (HSPA+)
- Mobile, fixed and portable wireless broadband access
- Evolution of mobile technology
- Optimized for IP-based traffic
- Increasing capacity
- Evolved Packet Core (EPC)
- Evolved Packet System (EPS)
- LTE Interfaces and protocols
- Service-Oriented Architecture of LTE: Content-based charging, End-to-end QoS, All-IP flat networks, Optimal routing of traffic, Seamless mobility
- LTE System Architecture Evolution: Control-pane latency and capacity, Coverage and Capacity, Spectrum flexibility, Radio Admission Control
- LTE/SAE/EPC/EPS Network Architecture: New enhanced base station, “Evolved NodeB (eNodeB), Access GateWay, Key logical functions
- LTE Operations and Procedures: System acquisition, Idle mode operations, Synchronization
- LTE Planning and Optimization: Traffic and QoS considerations, Capacity planning considerations, Antenna selections, Site location and integration

PRICING COURSES & CERTIFICATIONS

TR-LTEBT	*Long Term Evolution (LTE) Basics*	**$1,500**
TC-LTEBT	*TFS Certification LTEBT*	**$150**

TR-LTENE LTE Training for Non-Engineers

LEVEL 2 — PREREQUISITE: NONE **2-DAY COURSE**

LTE Training for Non-Engineers training course provides a high level view of LTE (Long Term Evolution) and its related technologies. This course is intended for managers, business professional and non-engineers who need to understand LTE and evolution of the mobile broadband to 4G. You'll gain a clear, cohesive understanding of LTE, SAE/EPC, OFDM, MIMO, VoLTE, IMS and from LTE fundamentals to the latest LTE technologies and services and how everything fits together.

Objectives

Upon completion of this fundamentals course, the attendees will have a basic understanding of the key concepts and requirements of LTE and understand the network architecture of LTE/E-UTRAN and EPC.

This course includes:

- The Mobile Broadband Evolution
- Goals and Objectives of LTE
- Interworking with other wireless technologies
- Services and Applications
- Migration to LTE and LTE-Advanced
- Global LTE Radio Spectrum
- Handover
- Roaming
- Security and Fraud
- Charging and Billing
- Location-based Services
- MBMS
- Voice over LTE (VoLTE) and SMS over LTE

Target Audience

Project managers, non-engineers and anyone else who needs to understand what LTE is.

COURSE LECTURES TOPICS INCLUDE

- Overview of LTE
- Key LTE technologies
- Concepts behind LTE/EPC Networks
- Key interfaces & protocols
- LTE Air Interface
- Concepts of OFDMA and SC-FDMA
- MIMO in LTE: MIMO (SU-MIMO, MU-MIMO)
- Security in LTE
- Frequency Planning
- Capacity Planning
- Roaming, Security and Fraud
- Charging and Billing
- Location-based Services

PRICING COURSES & CERTIFICATIONS

TR-LTENE	*LTE Training for Non-Engineers*	**$1,500**
TC-LTENE	*TFS Certification LTENE*	**$150**

TR-LTEBC LTE Training Boot Camp

LEVEL 2 — PREREQUISITE: NONE **4-DAY COURSE**

LTE Training is an intensive learning experience that covers the essential elements of Long Term Evolution (LTE). LTE Training Crash Course covers the foundation of LTE, LTE RAN, concepts behind OFDMA/SC-FDMA, Overview of MIMO, LTE Cell Planning, LTE Capacity Planning, EPC, IMS, Diameter, EPC Signaling, Security, Voice over LTE, LTE-Advanced, LTE Backhaul (both Microwave and Metro Ethernet), PPE-TE, MPLS-TP and more.

Long Term Evolution (LTE) training crash course – Boot Camp introduces LTE and related technologies required to plan, design, implement and manage the evolution route for wireless and cellular network operators towards 4G broadband mobile networks. These courses range from basics technological overview programs to detailed engineering and design LTE courses.

LTE Training Boot Camp is the answer to your LTE-EPC/EPS technology needs. This innovative and intensive learning experience covers the essential elements of LTE and SAE/EPC/EPS in a nutshell by the industry experts.

This course includes:

- Comprehension of the basics of LTE/EPC/EPS
- LTE Architecture, Protocols and Signaling
- LTE Multiple Access Methods
- Evolved Packet Core (EPC), SAE (System Architecture Evolution) and Evolved Packet System (EPS)
- LTE Radio and Core Network Planning and Design Procedures
- LTE Backhaul Requirements
- Quality of Service (QoS), Call setup procedures, Mobility support, LTE and EPC Security Architecture

Target Audience

Engineers and Non-Engineers professionals who need a thorough understanding of LTE, EPC, Services, Protocols, RF and Core Planning and Design, Backhaul, Capacity Planning, QoS, Security, VoLTE and LTE-Advanced.

COURSE LECTURES TOPICS INCLUDE

- Overview of LTE: Evolution from GSM/GPRS and UMTS/HSPA to LTE and LTE Advanced, GSM (Global System for Mobile Communications, GPRS (General Packet Radio Service), EDGE and EDGE II, UMTS (Universal Mobile Telecommunication System), HSPA/HSPA+, LTE and LTE Advanced
- Overview of IP Convergence in the mobile networks: Wireless Internet Basics, GSM/EGPRS/UMTS/HSPA/HSPA+, Ethernet Backhaul for LTE, LTE Protocols and Signaling
- Overview of LTE SAE, Evolved Packet Core (EPC) and EPS
- Overview of LTE-EPC Networks and Signaling
- LTE and 1x/1xEV-DO (eHRPD) Interworking
- LTE and GSM/UMTS Interworking
- IMS Architecture and Protocols Applied to LTE
- LTE and EPC Security
- QoS Applied to LTE-EPC
- Introduction to LTE (Long Term Evolution) & EPC/EPS: Long Term Evolution (LTE) as a new radio platform technology, Support to achieve higher peak throughputs than HSPA+ in higher spectrum bandwidth, LTE for mobile, fixed and portable wireless broadband access, Optimized for IP-based traffic
- LTE Network Architecture: LTE Interfaces and protocols, Introduction to E-UTRAN, E-UTRAN network architecture, E-UTRAN protocols, Orthogonal Frequency Division Multiplexing (OFDM), Architecture and node functions
- Key interfaces: S1, S5, S6, S10 and S11
- Key features and services
- LTE/SAE/EPC Network Architecture
- Evolved UTRAN and Evolved Packet Core
- LTE/EPC Interworking
- Overview of LTE and EPC Protocol Stacks
- Overview of LTE and EPC Interfaces
- LTE-EPC Signaling Principals
- IMS (IP Multimedia Subsystem) in LTE
- Overview of Diameter Protocol
- Diameter Applications in IMS
- LTE Operations and Procedures
- LTE Planning and Optimization
- Ethernet Backhaul for LTE
- QoS Applied to LTE-EPC
- PCC (Policy and Charging Control)
- LTE and EPC Security
- Overview: LTE Air Interface, OFDM and MIMO
- LTE RF Planning and Design
- LTE Backhaul Requirements
- LTE Backhaul Aggregation Network Technology

PRICING COURSES & CERTIFICATIONS

TR-LTEBC	*LTE Training Boot Camp*	**$4,000**
TC-LTEBC	*TFS Certification LTEBC*	**$150**

TR-UBWA Ubiquiti Wireless Admin

LEVEL 2 — PREREQUISITE: NONE **2-DAY COURSE**

The Broadband Wireless Admin course is a two-day instructor-led training that features the Ubiquiti product line. The course focuses on the concepts of outdoor wireless networking. This course provides an emphasis on how to design, build and manage a successful wireless ISP.

Objectives

This intermediate-level course teaches professionals in the service provider industry how to design, manage, and troubleshoot the wireless infrastructure of an ISP network, specifically using Ubiquiti equipment.

This course includes:

- RF Theory & Link Planning
- Radio Operation & Modulation
- Antenna Design & Gain
- Specific Ubiquiti Features
- WISP Network Topologies

Target Audience

The UBWA course targets students who have some experience in wireless networking, independent of vendor. Both courses are fast-paced and feature plenty of lab activities to reinforce theory and practice technical concepts

COURSE PREREQUISITES

While not a prerequisite to the UBWA course, the UBWS (Specialist) course teaches you basic, foundational wireless concepts, regardless of your technical background. It also introduces you to the vast potential of Ubiquiti's outdoor wireless products while familiarizing you with the radio web management platform, airOS.

COURSE LECTURES TOPICS INCLUDE

- RF Theory: Frequency vs. Propagation, Unlicensed Bands, OFDM Spectral Masks, Licensed Frequencies, Decibels in RF Systems, Free Space Path Loss, EIRP, Line of Sight & Fresnel Zones, Link Power Budgets, Fade Margin
- Radio Operation: Standard RF Circuit, Carrier Signals, Radio Sensitivity, Radio Selectivity, Signal, Noise & Interference, Chains, Data Rates & MIMO, Thermal Noise, Channel Flexing, airPrism Technology, Modulation, EVM & Data Rates
- Antenna Theory: What is Gain?, Isotropic Radiators, Antenna Function, Gain, Efficiency & VSWR, Gain, Surface Area & Directivity, Polar Plots, MIMO, Polarization & XPD, Types of Antennas, Antenna Alignment, Downtilt, Lobes & Nulls
- Ubiquiti Service Providers: TDMA & airMAX Protocol, 802.11, CSMA/CA & Indoor, Problem of Hidden Node, airMAX-AC, airOS-6 & -8, Traffic Shaping & Burst, Scalability vs. Performance, Security & VLANs, airFiber Technology & Protocols, airOS Tools & Redundancy, Bridged vs. Routed ISP

PRICING COURSES & CERTIFICATIONS

TR-UBWA	*Ubiquiti Wireless Admin*	**$2,000**
TC-UBWA	*TFS Certification UBWA*	**$150**

TR-UEWA Ubiquiti Enterprise Wireless Admin

LEVEL 2 — PREREQUISITE: NONE **2-DAY COURSE**

The Ubiquiti Enterprise Wireless Admin course is a two-day instructor-led training that features the Ubiquiti product line. This course provides an emphasis on designing/managing UniFi WLANs. Course includes hands-on labs using the latest generation of UniFi Aps as well as UniFi controller platform.

Objectives

This two-day, in-class training course teaches the most important concepts in Enterprise Networks, focusing especially on Wireless Networks. The course has been completely redesigned with new course materials and lab activities using UAP-AC-LITE and other UniFi hardware to emphasize on how to design, build, and manage the latest, top-performing WLANs.

This course includes:

- WLAN Fundamentals
- WLAN Planning
- Deployment
- Basic Adoption & Setup
- Advanced Management
- Guest Portal & HotspotSpecific Ubiquiti Features
- WISP Network Topologies

Target Audience

The UEWA course targets students who have some experience in wireless networking, independent of vendor. Both courses are fast-paced and feature plenty of lab activities to reinforce theory and practice technical concepts. At the conclusion of the course, you can take an exam to certify at the level of Ubiquiti Enterprise Wireless Admin. If you pass at 65% or higher, you will receive a student certificate.

COURSE PREREQUISITES

While not a prerequisite to the UEWA course, the UBRSS (Ubiquiti Broadband Routing & Switching Specialist) course teaches you basic, foundational networking concepts, regardless of your technical background. It also explains how different Ubiquiti products, such as routers, switches, and access points are configured and deployed in broadband & enterprise networks.

COURSE LECTURES TOPICS INCLUDE

- WLAN Fundamentals: Unlicensed Radio Spectrum, Channel Operation, Regulatory Domains, WLAN Standards, Wireless Access Methods, Network Equipment
- WLAN Planning: Wireless Technology, Coverage & Channels, TX Power, Antenna Gain, Channel Availability, Signals vs. Noise, Airtime, Capacity & Density, Mixed Networks
- Deployment: Site Surveys, Overlap, Wiring & PoE, Benchmarking
- Basic Adoption & Configuration: Multi-Site, Layer-2 Adoption, WLAN Groups, SSID, Security & VLANs
- Analytics: Advanced Adoption & Guests, Cloud Hosting, Layer-3 Adoption, Discovery, SSH, DNS & DHCP, Minimum RSSI, Zero-Handoff Roaming, Guest Portal, Access Controls, Customization

PRICING COURSES & CERTIFICATIONS

TR-UEWA	*Ubiquiti Enterprise Wireless Admin*	**$2,000**
TC-UEWA	*TFS Certification UEWA*	**$150**

TR-UBRSS Ubiquiti Broadband Routing & Switching Specialist

LEVEL 2 — PREREQUISITE: NONE **3-DAY COURSE**

The Ubiquiti Broadband Routing & Switching Specialist course is a three-day instructor-led training that features the Ubiquiti product line. This course provides information on core protocols and technologies used in today's Internet Service Provider Networks. The course includes practical, real-world WISP examples as well as hands-on lab activities using EdgeMAX hardware.

Objectives

This is an entry-level course specially designed for networking professionals in the service provider background.

This course includes:

- First-time use, setup & management of network equipment
- Basic network design, protocol stacks and data models
- Addressing and subnetting for IPv4 networks
- Anatomy of a router and essential routing protocols
- Standard network services and security across different OSI layers

Target Audience

The UBRSS course is designed for students with virtually no prior knowledge of network theory. Mastery of the UBRSS course concepts is crucial to your success in the networking world and advancement through the Ubiquiti Academy.

COURSE PREREQUISITES

The UBRSS course is designed for students with virtually no prior knowledge of network theory.

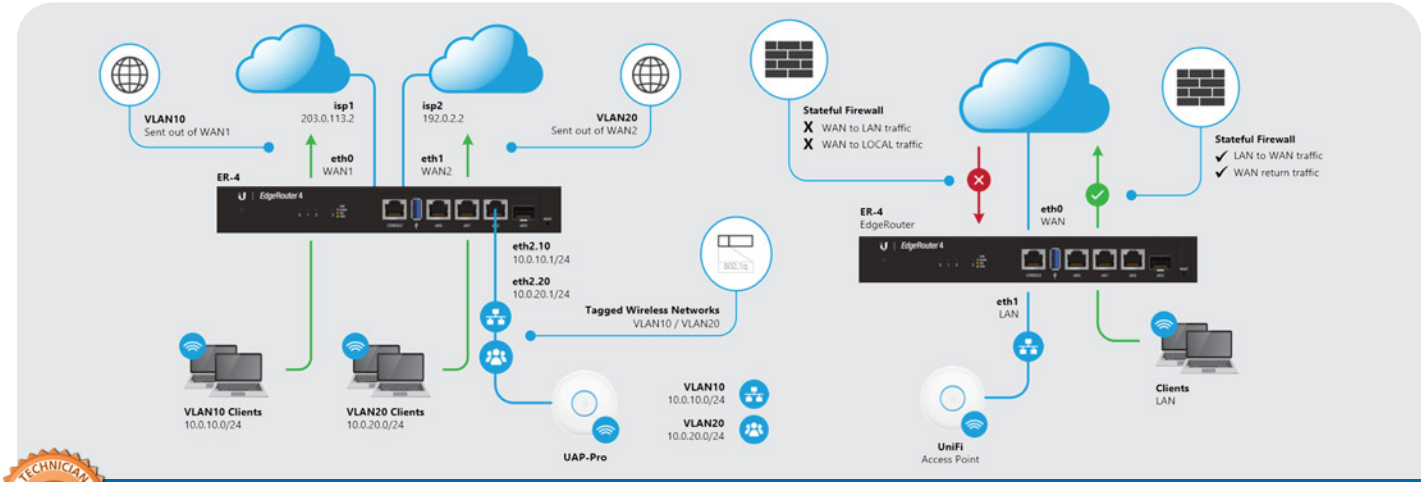
COURSE LECTURES TOPICS INCLUDE

- Device Management: Configure Lab Equipment, EdgeMAX Product Family
- IPv4 Subnetting: Addressing Basics, Subnetting, VLSM for Providers, Summarization
- Network Design: OSI Model & Encapsulation, Network Topology Foundations, Network Interfaces, The Local Network, Network Communication, The Wide Area Network
- Routing: Routing Tables, Static Routing Protocols, Dynamic Routing Protocols
- Services & Security: DHCP, DNS, NAT, Firewalls, Tunnel & VPN
- Appendices: IPv6 Intro, EdgeOS Commands, Addressing & Routing Tables

PRICING COURSES & CERTIFICATIONS

TR-UBRSS	*Ubiquiti Broadband Routing & Switching Specialist*	**$2,900**
TC-UBRSS	*TFS Certification UBRSS*	**$150**

TR-UBRSA Ubiquiti Broadband Routing and Switching Admin



LEVEL 2 — PREREQUISITE: NONE **2-DAY COURSE**

The Ubiquiti Broadband Routing & Switching Admin (UBRSA) is Ubiquiti's second, two-day course designed for professionals in the Service Provider market that desire greater knowledge about how EdgeMAX products are used in today's carrier networks.

Objectives

The lab activities in this course are designed to mimic real-world scenarios involving STP, VLANs, OSPF/BGP/policy-based routing, as well as firewall applications.

Target Audience

The Ubiquiti Broadband Routing & Switching Admin (UBRSA) course is designed for students to learn the core protocols and technologies used in today's service provider networks. The curriculum contains practical, real-world examples as well as hands-on lab activities with EdgeMAX equipment to enhance student learning.

COURSE LECTURES TOPICS INCLUDE

- Virtual LANs
- Advanced L2 Studies
- Policy-Based Routing
- BGP Operation
- Multi-Area OSPF

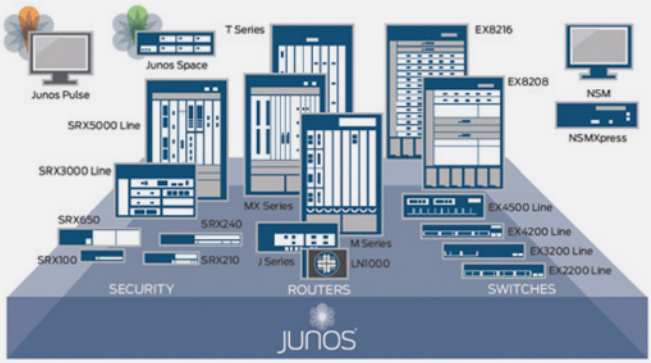
PRICING COURSES & CERTIFICATIONS

TR-UBRSA	*Ubiquiti Broadband Routing and Switching Admin*	**$2,500**
TC-UBRSA	*TFS Certification UBRSA*	**$150**

COURSE PREREQUISITES

While not a prerequisite to the UBRSA course, UBRSS lays the foundations for the fundamental routing and switching concepts that surround service provider networks, including VLANs, Policy-Based Routing, multi-area OSPF, as well as intro-to-BGP.

TR-IJOS Introduction to the Junos Operating System



LEVEL 1 — PREREQUISITE: NONE **3-DAY COURSE**

This three-day course provides students with the foundational knowledge required to work with the Junos operating system and to configure Junos devices. The course provides a brief overview of the Junos device families and discusses the key architectural components of the software. Key topics include user interface options with a heavy focus on the command-line interface (CLI), configuration tasks typically associated with the initial setup of devices, interface configuration basics with configuration examples, secondary system configuration, and the basics of operational monitoring and maintenance of Junos devices.

The course then delves into foundational routing knowledge and configuration examples including general routing concepts, routing policy, and firewall filters.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring basic device operations.

Target Audience

This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

COURSE PREREQUISITES

Students should have basic networking knowledge and an understanding of the Open Systems Interconnection (OSI) reference model and the TCP/IP protocol suite.

COURSE LABS HANDS-ON

- The Junos CLI
- Initial System Configuration
- Secondary System Configuration
- Operational Monitoring and Maintenance
- The J-Web Interface
- Routing Fundamentals
- Routing Policy
- Firewall Filters
- Class of Services (CoS)

COURSE LECTURES TOPICS INCLUDE

- Introduction - Course Objectives
- Junos Operating System Fundamentals
- User Interface Options
- Initial Configuration
- Secondary System Configuration
- Operational Monitoring and Maintenance
- Interface Configuration Examples
- The J-Web Interface
- Routing Fundamentals, Routing Policy
- Firewall Filters
- Class of Services (CoS)

For course dates and locations, call
877-529-9114
Visit The Fiber School training website:
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for more information on Juniper Networks classes.

PRICING COURSES & CERTIFICATIONS

TR-IJOS	*Intro to the Junos OS*	**$2,500**
TC-IJOS	*TFS Certification*	**$150**

TR-JIR Junos Intermediate Routing

LEVEL 2 — PREREQUISITE: TR-IJOS **2-DAY COURSE**

This two-day course provides students with intermediate routing knowledge and configuration examples. The course includes an overview of protocol independent routing features, load balancing and filter-based forwarding, OSPF, BGP, IP tunneling, and high-availability (HA) features.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring device operations. This course uses Juniper Networks SRX Series Services Gateways for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running the Junos OS. This course is based on Junos OS Release 12.1R1.9.

Target Audience

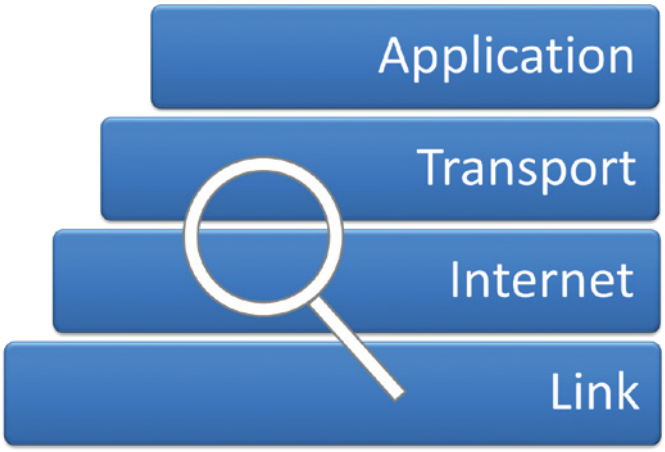
Network engineers, technical support personnel, reseller support engineers, and others responsible for implementing and/or maintaining the Juniper Networks products covered in this course.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Intermediate Routing
- Protocol-Independent Routing
- Load Balancing and Filter-Based Forwarding
- Open Shortest Path First (OPSF)
- Border Gateway Protocol
- IP Tunneling
- High Availability

COURSE PREREQUISITES

*Students should have basic networking knowledge and an understanding of the OSI model and the TCP/IP protocol suite. Students should also have attended the Introduction to Junos Operating Systems (**TR-IJOS**) and Junos Routing Essentials (**TR-JRE**) courses prior to attending this class.*



COURSE LABS HANDS-ON

- Introduction: Course Objectives
- Configure and Monitor: Static/aggregate/generated routes
- Configure and Share: Routes between routing instances
- Describe: Load-balancing concepts and operations
- Implement and Monitor Filter-based Forwarding
- OSPF: Configure, monitor and troubleshoot
- IP Tunneling: Concepts and Applications
- IPv4 versus IPv6
- IS-IS: Operations, configure, monitor and troubleshoot

For course dates and locations, call
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thefiberschool.com/courses/juniper-networks/
for more information on Juniper Networks classes.

PRICING COURSES & CERTIFICATIONS

TR-JIR	*Junos Intermediate Routing*	**$1,600**
TC-JIR	*TFS Certification*	**$150**

TR-AJER Advanced Juniper Enterprise Routing

LEVEL 3 — PREREQUISITE: TR-JIR **3-DAY COURSE**

This three-day course is designed to provide students with the tools required for implementing, monitoring, and troubleshooting Layer 3 components in an enterprise network. Detailed coverage of OSPF, BGP, class of service (CoS), and multicast is strongly emphasized. The course also exposes students to common troubleshooting commands and tools used to troubleshoot various intermediate to advanced issues.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos operating system and in monitoring device and protocol operations.

This course uses Juniper Networks vSRX virtual firewall for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running the Junos OS. This course is based on Junos OS Release 15.1X49-D70.

Target Audience

This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

COURSE PREREQUISITES

*Students should have basic networking knowledge and an understanding of the Open Systems Interconnection (OSI) model and the TCP/IP protocol suite. Students should also have working experience with basic routing principles. Students should also have attended the Introduction to the Junos Operating System (**TR-IJOS**), Junos Routing Essentials (**TR-JRE**), and Junos Intermediate Routing (TR-JIR) courses prior to attending this class.*

COURSE LECTURES TOPICS INCLUDE

- Introduction: Course Objectives
- OSPF Area Types: Describe types and operations, configure various types
- BGP: Describe basic operation, explain the route selection process, configure advanced options for BGP peers, manipulation BGP attributes using routing policy
- Routing Policy: Describe common policies used in the enterprise environment, implement a routing policy for inbound and outbound traffic using BGP
- CoS: Describe various components and their functions, explain processing along with CoS defaults, implement CoS features in an enterprise environment
- Configure and monitor Internet Group Management Protocol (IGMP)
- Identify common multicast routing protocols

For course dates and locations, call
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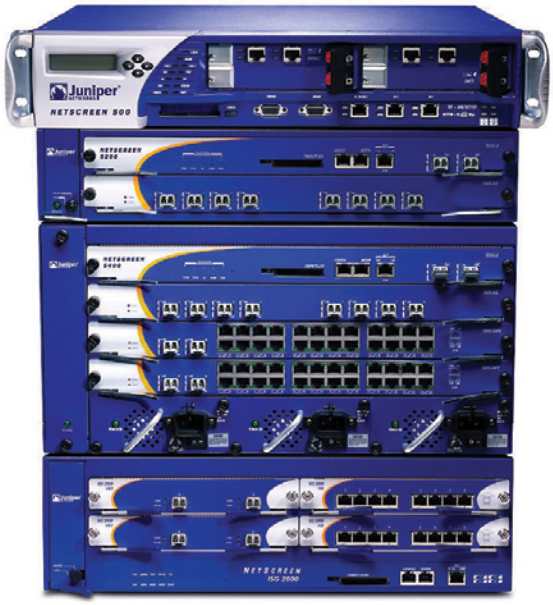
for more information on Juniper Networks classes.



COURSE LABS HANDS-ON

- Configuring and Monitoring OSPF
- Configuring and Monitoring OSPF Areas and Route Summarization
- Configuring and Monitoring Routing Policy and Advanced OSPF Policy
- Implementing BGP
- BGP Attributes
- Implementing Enterprise Routing Policies
- Implementing PIM-SM
- Implementing SSM
- Implementing CoS Features in the Enterprise
- BGP Route Reflection (Optional)

PRICING COURSES & CERTIFICATIONS

TR-AJER	*Junos Advanced Juniper Enterprise Routing*	**$5,000**
TC-AJER	*TFS Certification*	**$150**

TR-AJSPR Advanced Junos Service Provider Routing

LEVEL 3 — PREREQUISITE: TR-JIR | 5-DAY COURSE

This five-day course is designed to provide students with detailed coverage of OSPF, IS-IS, BGP, and routing policy. This course uses Juniper Networks vMX Series Routers for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running the Junos OS. This course is based on the Junos OS Release 17.1.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring, monitoring, and troubleshooting the Junos operating system and in monitoring device and protocol operations. Describe the various OSPF link-state advertisement (LSA) types.

After successfully completing this course, you should be able to:

- Explain the flooding of LSAs in an OSPF network.
- Describe the shortest-path-first (SPF) algorithm.
- List key differences between OSPFv2 and OSPFv3.
- Describe OSPF area types and operations.
- Configure various OSPF area types.
- Summarize and restrict routes.
- Identify some scenarios in a service provider network that can be solved using routing policy or specific configuration options.
- Use routing policy and specific configuration options to implement solutions for various scenarios.
- Describe how to troubleshoot OSPF.
- Explain the concepts and operation of IS-IS.
- Describe various IS-IS link-state protocol data unit (LSP) types.
- List IS-IS adjacency rules and troubleshoot common adjacency issues.
- Configure and monitor IS-IS.

Target Audience

This course benefits individuals responsible for implementing, monitoring, and troubleshooting Layer 3 components of a service provider's network.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Advanced Junos Service Provider Routing
- OSPF: OSPFv2 Review, Link-State Advertisements, Protocol Operations, OSPF Authentication
- OSPF Areas: Review of areas, Stub Area Operation and Configuration, NSSA Operation and Configuration, Route Summarization
- OSPF Case Studies and Solutions: Virtual Links, OSPF Multiarea Adjacencies, External Reachability
- Troubleshooting OSPF
- IS-IS: Overview, PDUs, Neighbors and Adjacencies, Configuring and Monitoring
- Advanced IS-IS Operations and Configuration Options: Operations, Configuration, Routing Policy
- Multilevel IS-IS Networks: Level 1 and Level 2 Operations, Multilevel Configuration
- Troubleshooting IS-IS
- BGP: Review, Operations, Path Select ion, Configuration
- BGP Attributes and Policy
- Route Reflection and Confederations
- BGP Route Damping
- Troubleshooting BGP
- Troubleshooting Policy

COURSE PREREQUISITES

Students should have intermediate-level networking knowledge and an understanding of the Open Systems Interconnection (OSI) model and the TCP/IP protocol suite. Students should also attend the Introduction to the Junos Operating System (IJOS) and Junos Intermediate Routing (JIR) courses prior to attending this class.

For course dates and locations, call
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for more information on Juniper Networks classes.

PRICING COURSES & CERTIFICATIONS

TR-AJSPR	*Advanced Junos Service Provider Routing*	**$5,000**
TC-AJSPR	*TFS Certification*	**$150**

TR-JSEC Junos for Security Platforms

LEVEL 2 — PREREQUISITE: TR-IJOS **5-DAY COURSE**

This five-day course covers the configuration, operation, and implementation of SRX Series Services Gateways in a typical network environment. Key topics within this course include security technologies such as security zones, security policies, Network Address Translation (NAT), IP Security (IPsec), and high availability clusters, as well as details pertaining to basic implementation, configuration, management, and troubleshooting.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring device operations. This course uses Juniper Networks SRX Series Services Gateways and Security Director for the hands-on component. This course is based on Junos OS Release 15.1X49-D70.3 and Junos Space Security Director 16.1.

After successfully completing this course, you should be able to:

- Describe traditional routing and security and the current trends in internetworking.
- Provide an overview of SRX Series devices and software architecture.
- Describe the logical packet flow and session creation performed by SRX Series devices.
- Describe, configure, and monitor zones.
- Describe, configure, and monitor security policies.
- Describe, configure, and monitor user firewall authentication
- Describe various types of network attacks.
- Configure and monitor Screen options to prevent network attacks.
- Explain, implement, and monitor NAT, as implemented on Junos security platforms.

Target Audience

The course benefits operators of SRX Series devices. These operators include network engineers, administrators, support personnel, and reseller support personnel.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Junos for Security Platforms
- Zones: Definition, Configuration, Monitoring
- Security Policies: Overview, Components, Scheduling
- Firewall User Authentication
- Common Administrative Tasks
- Screen Options
- Network Address Translation (NAT)
- IPsec VPNs: Types, Requirements, Details, Monitoring
- Intro to Intrusion Detection and Prevention (IDP)
- High Availability Clustering Overview and Implementation

COURSE PREREQUISITES

Students should have basic networking knowledge and an understanding of the OSI model and the TCP/IP protocol suite. Students should also either have attended the Introduction to the Junos Operating System (TR-IJOS) and Junos Routing Essentials (TR-JRE) courses prior to attending this class, or have equivalent experience with Junos Software.

COURSE LABS HANDS-ON

- Introduction: Course Objectives
- Overview of Junos security platforms and software
- Zones: Describe, configure and monitor
- Security Policies: Describe, configure and monitor
- Firewall User Authentication: Describe, configure and monitor
- Screen Options
- NAT: Explain, implement and monitor
- IPsec VPNs: Explain the purpose and mechanics
- IDP Signature Database: Utilize and update on Junos security platforms

For course dates and locations, call
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thefiberschool.com/courses/juniper-networks/
for more information on Juniper Networks classes.

PRICING COURSES & CERTIFICATIONS

TR-JSEC	*Junos for Security Platforms*	**$4,000**
TC-JSEC	*TFS Certification*	**$150**

TR-AJSEC Advanced Junos Security

LEVEL 3 — PREREQUISITE: TR-JSEC **5-DAY COURSE**

This five-day course, which is designed to build off of the current Junos Security (JSEC) offering, delves deeper into Junos security. This course is based on Junos OS Release 15.1X49-D70.3 and Junos Space Security Director 16.1.

Target Audience

This course benefits individuals responsible for implementing, monitoring, and troubleshooting Junos security components.

Objectives

Through demonstrations and hands-on labs, you will gain experience in configuring and monitoring the advanced Junos OS security features with advanced coverage of virtualization, AppSecure, advanced Network Address Translation (NAT) deployments, Layer 2 security, and Sky ATP. This course uses Juniper Networks SRX Series Services Gateways for the hands-on component.

After successfully completing this course, you should be able to:

- Demonstrate understanding of concepts covered in the prerequisite Junos Security course.
- Describe the various forms of security supported by the Junos OS.
- Implement features of the AppSecure suite, including AppID, AppFW, AppTrack, AppQoS, and SSL Proxy.
- Configure custom application signatures.
- Describe Junos security handling at Layer 2 versus Layer 3.
- Implement next generation Layer 2 security features.
- Demonstrate understanding of Logical Systems (LSYS).
- Use Junos debugging tools to analyze traffic flows and identify traffic processing patterns and problems.
- Describe Junos routing instance types used for virtualization.

For course dates and locations, call 877-529-9114
Visit The Fiber School training website: thefiberschool.com/courses/juniper-networks/ for more information on Juniper Networks classes.

COURSE PREREQUISITES

*Students should have a strong level of TCP/IP networking and security knowledge. Students should also have attended the Introduction to the Junos Operating System (**TR-IJOS**), Junos Routing Essentials (**TR-JRE**), and Junos Security (**TR-JSEC**) courses prior to attending this class.*

COURSE LECTURES TOPICS INCLUDE

- Introduction: Course Objectives
- Junos Layer 2 Packet Handling and Security Features
- Virtualization: Routing instances, Logical Systems (LSYS)
- AppSecure Suite Theory and Implementation: AppID, AppFW, and AppTrack
- Working with Log Director: Overview, components, install, setup, administration
- Sky ATP Theory and Implementation
- IPS Policy & Configuration
- SDSN: Overview, components, troubleshooting
- Enforcement, Monitoring and Reporting: User role firewall and integrated user firewall overview
- Troubleshooting Junos Security: Methodology, Tools, Identifying IPsec issues

PRICING COURSES & CERTIFICATIONS

TR-AJSEC	*Advanced Junos Security*	**$4,000**
TC-AJSEC	*TFS Certification*	**$150**

TR-JEX Junos Enterprise Switching

LEVEL 3 — PREREQUISITE: TR-JIR | 5-DAY COURSE

The Junos Enterprise Switching Course (TR-JEX) is a two-day course that provides students with introductory switching knowledge and configuration examples. This course includes an overview of switching concepts and operations, virtual LANs, spanning tree protocol, port and device security features, and high-availability features.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring device operations.

Target Audience

This course is intended for network engineers, support personnel, reseller support and others responsible for implementing Juniper Security products using the advanced features covered in this class.

COURSE PREREQUISITES

*Students should have intermediate-level networking knowledge and an understanding of the OSI model and the TCP/IP protocol suite. Students should also have familiarity with the Protocol Independent Multicast-Sparse Mode (PIM-SM) protocol. Students should have attended Introduction to Junos Operating Systems (**TR-IJOS**) and Junos Routing Essentials (**JRE**) courses prior to attending this class.*

For course dates and locations, call
877-529-9114
Visit The Fiber School training website:
thefiberschool.com/courses/juniper-networks/
for more information on Juniper Networks classes.

COURSE LECTURES TOPICS INCLUDE

- Introduction: Course Objectives
- Layer 2 Switching
- Ethernet Bridging Basics
- Terminology and Design Considerations
- Layer 2 Switching Operations: Enabling and Monitoring
- Configuring and Monitoring VLANs
- Spanning Tree Protocol (STP): Overview, Configuring
- Rapid Spanning Tree Protocol (RSTP): Overview, Configuring and Monitoring
- Protection Features
- Port Security
- MAC Limiting
- Dynamic ARP Inspection (DAI)
- DHCP Snooping
- Device Security
- Firewall Filters
- High Availability
- Link Aggregation Groups (LAGs)
- Redundant Trunk Groups (RTGs)
- Virtual Chassis

PRICING COURSES & CERTIFICATIONS

TR-JEX	*Junos Enterprise Switching*	**$2,000**
TC-JEX	*TFS Certification*	**$150**

TR-AJEX Advanced Junos Enterprise Switching

LEVEL 3 — PREREQUISITE: TR-IJOS **2-DAY COURSE**

This two-day course provides detailed coverage of virtual LAN (VLAN) operations, Multiple Spanning Tree Protocol (MSTP) and VLAN Spanning Tree Protocol (VSTP), authentication and access control for Layer 2 networks, IP telephony features, class of service (CoS), and monitoring and troubleshooting tools and features supported on the EX Series Ethernet Switches.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos operating system and in monitoring device and protocol operations. This course uses Juniper Networks EX-4200 Series Ethernet Switches for the hands-on component.

After successfully completing this course, you should be able to:

- Implement filter-based VLAN assignments
- Restrict traffic flow within a VLAN
- Manage dynamic VLAN registration
- Tunnel Layer 2 traffic through Ethernet networks
- Review the purpose and operations of a spanning tree
- Implement multiple spanning-tree instances in a network
- Implement one or more spanning-tree instances for a VLAN
- List the benefits of implementing end-user authentication
- Explain the operations of various access control features
- Configure and monitor various access control features
- Describe processing considerations when multiple authentication and access control features are enabled
- Describe some common IP telephony deployment scenarios Describe features that facilitate IP telephony deployments
- Configure and monitor features used in IP telephony deployments
- Explain the purpose and basic operations of CoS
- Describe CoS features used in Layer 2 networks
- Configure and monitor CoS in a Layer 2 network

Target Audience

Network engineers, technical support personnel, reseller support engineers, and others responsible for implementing and/or maintaining the Juniper Networks products covered in this course. AJEX is an advanced-level course and benefits individuals responsible for configuring and monitoring EX Series switches.

For course dates and locations, call
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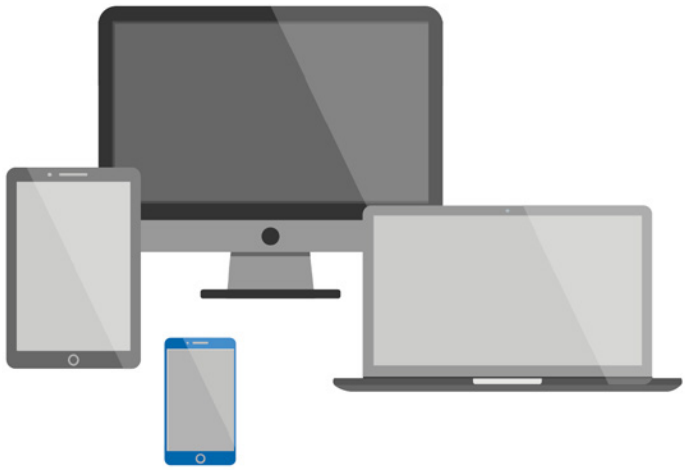
for more information on Juniper Networks classes.



COURSE LECTURES TOPICS INCLUDE

- Introduction to Advanced Junos Enterprise Switching
- Advanced Ethernet Switching: Virtual Local, Automating VLAN Administration, Tunneling Layer 2 Traffic
- Advanced Spanning Tree: Spanning Tree Review, MSTP, VSTP
- Authentication and Access Control: Overview, Features, Processing
- Deploying IP Telephony Features: Deployment Scenarios, IP Telephony Features
- Class of Service (Cos)
- Monitoring and Troubleshooting Layer 2 Networks

PRICING COURSES & CERTIFICATIONS

TR-AJEX	*Advanced Junos Enterprise Switching*	**$2,000**
TC-AJEX	*TFS Certification*	**$150**

TR-JNCIS-ENT Junos Certification Boot Camp

LEVEL 3 — PREREQUISITE: TR-IJOS **4-DAY COURSE**

This four-day program includes an overview of protocol independent routing features, load balancing and filter-based forwarding, OSPF, BGP, IP tunneling, switching concepts and operations, virtual LANs (VLANs), the Spanning Tree Protocol (STP), port and device security features, and high-availability (HA) features.

Objectives

Students will learn Layer 2 and Layer 3 principles, configuration standard practices, and design and implementation design requirements.

This bundle course includes course information from:

- TR-JEX
- TR-JIR

Target Audience

Designed for experienced networking professionals with beginner to intermediate knowledge of routing and switching implementations in Junos.

For course dates and locations, call
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for more information on Juniper Networks classes.

COURSE PREREQUISITES

Students should have basic networking knowledge and an understanding of the OSI model and the TCP/IP protocol suite. Students should also have attended the Introduction to the Junos Operating System (IJOS) and the Junos Routing Essentials (JRE) courses prior to attending this class.

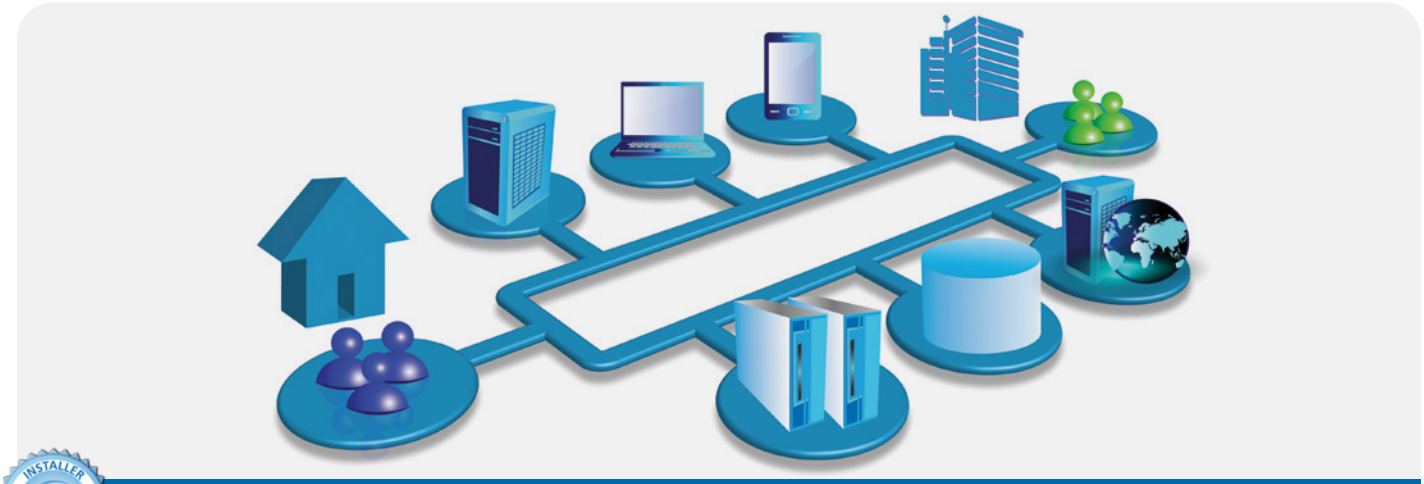
COURSE LECTURES TOPICS INCLUDE

- Introduction: Course Objectives
- Protocol-Independent Routing
- Load Balancing and Filter-Based Forwarding
- Open Shortest Path *First
- Border Gateway Protocol
- IP Tunneling
- High Availability
- Layer 2 Switching
- Virtual Networks
- Spanning Tree
- Port Security
- Device Security and Firewall Filters
- Virtual Chassis
- High Availability Features

PRICING COURSES & CERTIFICATIONS

TR-JNCIS-ENT	*Junos Certification Boot Camp*	**$3,500**
TC-JNCIS	*TFS Certification*	**$150**

TR-JMF Junos MPLS Fundamentals



LEVEL 1 — PREREQUISITE: TR-IJOS **2-DAY COURSE**

This two-day course is designed to provide students with a solid foundation on Multiprotocol Label Switching (MPLS). After introducing concepts such as MPLS forwarding and the structure of the MPLS header, the course will delve into the configuration and operation of the two main label distribution protocols, RSVP and LDP. Special emphasis is given to the central topics of traffic engineering and MPLS traffic protection, including fast reroute, link/node protection, and LDP Loop-Free Alternate. The concepts are put into practice with a series of in-depth hands-on labs, which will allow participants to gain experience in configuring and monitoring MPLS on Junos OS devices. This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

Objectives

After successfully completing this course, you should be able to:

- Describe the history & rationale for MPLS & basic terminology.
- Explain the MPLS label operations (push, pop, swap) and the concept of label-switched path (LSP).
- Describe the configuration & verification of MPLS forwarding.
- Describe the functionalities and operation of RSVP and LDP.
- Configure and verify RSVP-signaled and LDP-signaled LSPs.
- Select and configure the appropriate label distribution protocol for a given set of requirements.
- Describe default Junos OS MPLS traffic engineering behavior.
- Explain the Interior Gateway Protocol (IGP) extensions used to build the Traffic Engineering Database (TED).
- Describe the Constrained Shortest Path First (CSPF) algorithm, its uses, and its path selection process.
- Describe administrative groups and how they can be used to influence path selection.
- Describe the default traffic protection behavior of RSVP-signaled LSPs.
- Explain the use of primary and secondary LSPs.
- Describe the operation and configuration of: fast reroute, link and node protection, LDP loop-free alternate.
- Describe the LSP optimization options.
- Explain LSP priority and preemption.
- Describe the behavior of fate sharing.
- Describe how SRLG changes the CSPF algorithm when computing the path of a secondary LSP.
- Explain how extended admin groups can be used to influence path selection.
- Explain the purpose of several miscellaneous MPLS features.

COURSE PREREQUISITES

Students should have intermediate-level networking knowledge and should be familiar with the Junos OS command-line interface (CLI). Students should also attend the Introduction to the Junos Operating System (IJOS), Junos Routing Essentials (JRE), and Junos Intermediate Routing (JIR) courses prior to attending this class.

For course dates and locations, call
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COURSE LECTURES TOPICS INCLUDE

- Introduction to Junos MPLS Fundamentals
- MPLS Foundation, Terminology, Configuration, Packet Forwarding
- Label Distribution Protocols: Protocols, RSVP, LDP
- Routing Table Integration: Mapping Next-Hops to LSPs, Route Resolution Example, Route Resolution Summary, IGP Passive Versus Next-Hop Self for BGP Destinations
- Constrained Shortest Path First: RSVP Behavior Without CSPF, CSPF Algorithm, CSPF Tie Breaking, Administrative Groups, Inter-area Traffic Engineered LSPs
- Fate Sharing: Junos OS Fate Sharing, SRLG, Extended Admin Groups
- MPLS Features: Forwarding Adjacencies, Policy Control over LSP Selection, LSP Metrics, Automatic Bandwidth, Container LSPs, TTL Handling, Explicit Null Configuration, MPLS Pings

PRICING COURSES & CERTIFICATIONS

TR-JMF	*Junos MPLS Fundamentals*	**$2,000**
TC-JMF	*TFS Certification*	**$150**

TR-JL2V Junos Layer 2 VPNs

LEVEL 3 — PREREQUISITE: TR-IJOS **2-DAY COURSE**

This two-day course is designed to provide students with MPLS-based Layer 2 virtual private network (VPN) knowledge and configuration examples. The course includes an overview of MPLS Layer 2 VPN concepts, such as BGP Layer 2 VPNs, LDP Layer 2 circuits, FEC 129 BGP autodiscovery, virtual private LAN service (VPLS), Ethernet VPN (EVPN), and Inter-AS Layer 2 VPNs. This course also covers Junos operating system-specific implementations of Layer 2 VPN instances, VPLS, and EVPNs. This course is based on the Junos OS Release 15.1R2.9. This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and in device operations.

After successfully completing this course, you should be able to:

- Define the term virtual private network.
- Describe the business drivers for MPLS VPNs.
- Describe the differences between Layer 2 VPNs and Layer 3 VPNs.
- List advantages for the use of MPLS Layer 3 VPNs and Layer 2 VPNs.
- Describe the roles of a CE device, PE router, and P router in a BGP Layer 2 VPN.
- Explain the flow of control traffic and data traffic for a BGP Layer 2 VPN.
- Configure a BGP Layer 2 VPN and describe the benefits and requirements of over-provisioning.
- Monitor and troubleshoot a BGP Layer 2 VPN.
- Explain the BGP Layer 2 VPN scaling mechanisms and route reflection.
- Describe the Junos OS BGP Layer 2 VPN CoS support.
- Describe the flow of control and data traffic for an LDP Layer 2 circuit.
- Configure an LDP Layer 2 circuit.
- Monitor and troubleshoot an LDP Layer 2 circuit.
- Describe the operation of FEC 129 BGP autodiscovery for Layer 2 VPNs.
- Configure a FEC 129 BGP autodiscovery Layer 2 VPN.
- Monitor and troubleshoot a FEC 129 BGP autodiscovery for Layer 2 VPNs.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Junos Layer 2 VPNs
- MPLS VPNs, Provider-Provisioned VPNs
- BGP Layer 2 VPNs: Overview of Layer 2 Provider-Provisioned VPNs, BGP Layer 2 VPN Operational Model: Control Plane, BGP Layer 2 VPN Operational Model: Data Plane, Preliminary BGP Layer 2 VPN Configuration, BGP Layer 2 Configuration, Monitoring and Troubleshooting BGP Layer 2 VPNs
- Layer 2 VPN Scaling and CoS: Review of VPN Scaling Mechanisms, Layer 2 VPNs and CoS
- LDP Layer 2 Circuits: LDP Layer 2 Circuit Operation, LDP Layer 2 Circuit Configuration, LDP Layer 2 Circuit Monitoring and Troubleshooting, FEC 129 BGP Autodiscovery Layer 2 Circuit Operation, FEC 129 BGP Autodiscovery Layer 2 Circuit Configuration, FEC 129 BGP Autodiscovery Monitoring and Troubleshooting
- Virtual Private LAN Services: Layer 2 MPLS VPNs Versus VPLS, BGP VPLS Control Plane, BGP VPLS Data Plane, Learning and Forwarding Process, Loops
- VPLS Configuration & Troubleshooting
- Ethernet VPN (EVPN): Overview, EVPN Control Plane, EVPN Operation, EVPN Configuration, EVPN Troubleshooting

PRICING COURSES & CERTIFICATIONS

TR-JL2V	*Junos Layer 2 VPNs*	**$2,000**
TC-JL2V	*TFS Certification*	**$150**

For course dates and locations, call
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for more information on Juniper Networks classes.

TR-JL3V Junos Layer 3 VPNs

LEVEL 3 — PREREQUISITE: TR-IJOS **3-DAY COURSE**

This three-day course is designed to provide students with MPLS-based Layer 3 virtual private network (VPN) knowledge and configuration examples. The course includes an overview of MPLS Layer 3 VPN concepts, scaling Layer 3 VPNs, Internet access, Interprovider L3VPNs, and Multicast for Layer 3 VPNs. This course also covers Junos operating system-specific implementations of Layer 3 VPNs. This course is based on the Junos OS Release 15.1R2.9.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and in device operations.

After successfully completing this course, you should be able to:

- Describe the value of MPLS VPNs.
- Describe the differences between provider-provisioned VPNs and customer-provisioned VPNs.
- Describe the differences between Layer 2 VPNs and Layer 3 VPNs.
- List the provider-provisioned MPLS VPN features supported by the JUNOS software.
- Describe the roles of a CE device, PE router, and P router in a BGP Layer 3 VPN.
- Describe the format of the BGP routing information, including VPN-IPv4 addresses and route distinguishers.
- Describe the propagation of VPN routing information within an AS.
- List the BGP design constraints to enable Layer 3 VPNs within a provider network.
- Explain the operation of the Layer 3 VPN data plane within a provider network.

Create a routing instance, assign interfaces to a routing instance, create routes in a routing instance, and import/export routes from a routing instance using route distinguishers/route targets.

Target Audience

This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

For course dates and locations, call **877-529-9114**
For more information on Juniper Networks classes, visit The Fiber School training website:
thefiberschool.com/courses/juniper-networks/

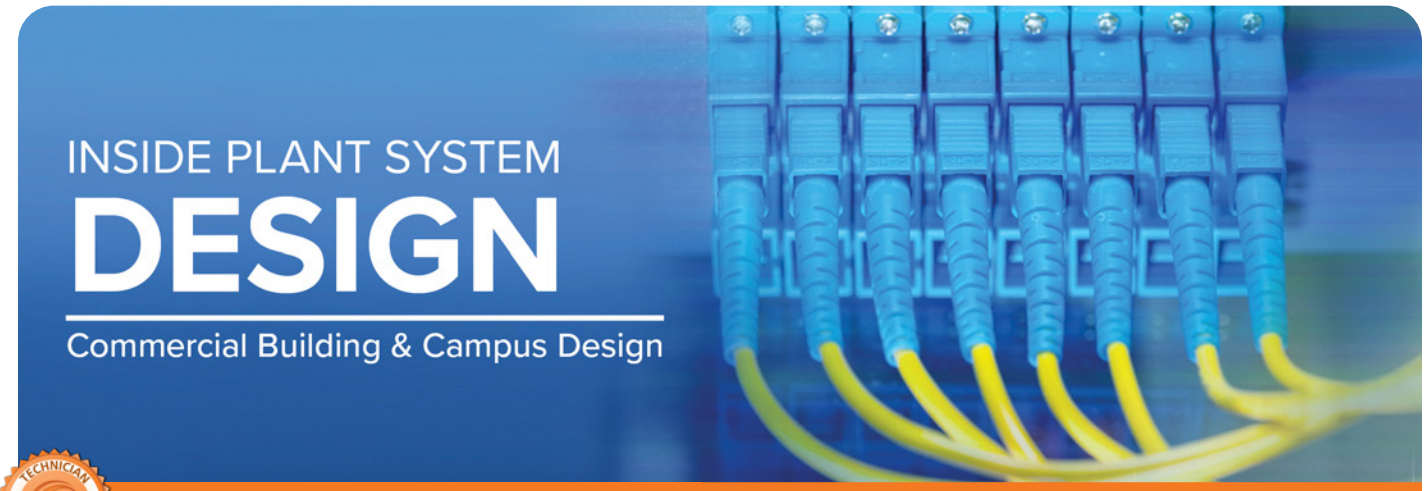
PRICING COURSES & CERTIFICATIONS

TR-JL3V	*Junos Layer 3 VPNs*	**$3,000**
TC-JL3V	*TFS Certification*	**$150**

OURSE LECTURES TOPICS INCLUDE

- Introduction to Junos Layer 3 VPNs
- MPLS VPNs, Provider-Provisioned VPNs
- Layer 3 VPNs: Layer 3 VPN Terminology, VPN-IPv4 Address Structure, Operational Characteristics
- Basic Layer 3 VPN Configuration: Preliminary Steps, PE Router Configuration
- Layer 3 VPN Scaling and Internet Access: Scaling Layer 3 VPNs, Public Internet Access Options
- Layer 3 VPNs – Advanced Topics: Exchanging Routes between Routing Instances, Hub-and-Spoke Topologies, Layer 3 VPN CoS Options, Layer 3 VPN and GRE Tunneling Integration, Layer 3 VPN and IPSec Integration, Layer 3 VPN Egress Protection, BGP prefix-independent convergence (PIC) edge for MPLS VPNs, VRF Localization, Provider Edge Link Protection, Support for configuring more than 3 million L3VPN Labels
- Interprovider Backbones for Layer 3 VPNs: Hierarchical VPN Models, Carrier-of-Carriers Model, Option C Configuration
- Troubleshooting Layer 3 VPNs: Working with Multiple Layers, Troubleshooting Commands on a PE Device, Multiaccess Interfaces in Layer 3 VPNs, PE and CE-based Traceroutes, Layer 3 VPN Monitoring Commands
- Draft Rosen Multicast VPNs: Overview, Draft Rosen MVPN Overview, Draft Rosen MVPN Operation, Configuration, Monitoring
- Next Generation Multicast VPNs: Multicast VPN Overview, Next-Generation MVPN Operation, Configuration, Monitoring, Internet Multicast, Ingress Replication, Internet Multicast Signaling and Data Plane, Configuring MVPN Internet Multicast, Monitoring MVPN Internet Multicast

TR-ISPD Inside Plant Network Design



LEVEL 2 — PREREQUISITE: TR-FOF **ONLINE SELF-PACED COURSE** **16 HOURS** of online instruction

Before fiber optic networks can be constructed, they must be properly designed and, once constructed, they must be managed. Efficiencies in these processes translate into lower cost layout and construction, more productive system migration and field operations, lower optical loss budget, and greater business profitability by bringing fiber to the desk.

The fiber optic network layout design plays an important role in error-free system reliability. Choice of the proper type of network layout depends on the type of process controlled, the possible need for expansion, and the degree of failure immunity desired – all of which must be balanced with cost considerations.

This 3-day, online course provides a detailed review of the major developments in basic layout network designs, including BUS, Star, Ring and Collapsed. System migrations and moving to future networks are also described.

Objectives

Certified Inside Plant System Design training will provide students with the necessary knowledge and skills to:

- Design standard-compliant, reliable and cost effective fiber optic networks
- Demonstrate an understanding of fiber optic installations
- Perform budget/loss analysis

Target Audience

Certified Fiber Optic Network Design is designed for new or experienced personnel seeking a deeper understanding of the design of fiber optic networks.

COURSE PREREQUISITES

Those participating should have a basic knowledge of electromagnetics and a comprehensive understanding of communication networks. Two years of field experience is recommended, including documented experience of installing fiber optic networks.

COURSE LECTURES TOPICS INCLUDE

- Introduction to fiber optic design
- Fiber Optic applications, current and future
- Overview of Fiber Optic Installation: OSP and ISP
- Practical considerations
- Campus backbone design study
- Building backbone design study
- Planning a Fiber Optic Network
- Choosing components
- Design Review: Component compatibilities, Power budget, Environmental requirements
- Determine requirements: cable, hardware and equipment
- Design, installation and implementation considerations
- Budget/loss analysis to insure correct network operation
- Testing and documentation
- Writing a Project Specification and other documentation

PRICING COURSES & CERTIFICATIONS

TR-ISPD	*Inside Plant System Design*	**$800**
TC-ISPD	*TFS Certification ISPD*	**$150**

TR-OSPD Outside Plant Network Design

LEVEL 2 — PREREQUISITE: TR-FOF | **ONLINE SELF-PACED COURSE** | **16 HOURS** of online instruction

The fiber optic System Designer: Outside Plant Design is for technicians and designers with fundamental fiber optic knowledge or installers and technicians interested in the planning, layout, design and testing of OSP infrastructure. It focuses specifically on outside plant installations (OSP). OSP includes communications such as building to building or long haul telecommunications (including customer-owned OSP.) Emphasis is on single mode fiber optic infrastructure installation and the associated international standards, theory, and practices and testing procedures.

COURSE PREREQUISITES

The following knowledge or experience level is recommended: 3 years fiber optic installation experience; Basic knowledge of splicing equipment and procedures; Basic knowledge of testing equipment and procedures; Be a TFS OSP Certified Installer/Technician or equivalent (desired); Be an ETA Fiber Installer or other Industry equivalent (desired).

COURSE LECTURES TOPICS INCLUDE

- Refresher on Fiber Optics: Fiber Optic Advantages and Applications, Terminology and History, The Fundamentals of Light Propagation, Scales of Measurement and the Spectrum
- Fiber Theory: Characteristics of Singlemode and Multimode, Manufacturing, Bandwidth and Linear effects
- Cables: Cable Types, Construction and Specifications
- Connectors and Terminations: Temporary and Permanent Connections, Connector Types, Mechanical and Environmental Considerations, Performance Specifications, Connector Loss Issues, Splicing Applications
- Splicing and Fusion and Mechanical: Fusion Splicing, Mechanical Splicing
- The 14 Steps toward Design: Steps necessary include selecting Standards, creating maps, and time-lines, determining fiber performance, cable, connector and splice specifications, and selecting wavelengths. Also covers passive devices, optoelectronic specifications, selecting hardware and defining testing, acceptance values and cost analysis.
- Installation: Planning and Standards, Premise/LAN and Methods, Outside Plant and Methods, Aerial and Burial Techniques, Installation Tools and Equipment
- Test Equipment: Loss Testing Tools and Equipment, Standards and Methods, Return Loss, Bandwidth and Dispersion, OTDR Theory and Applications, Loss and System Budget Calculations
- System Components and Design Issues: Transmitters and Receivers, Passive Optical Components, Couplers and Splitters, WDM and DWDM Issues
- System Design Exercise: Tools and Equipment, Practical Applications, Time Saving Techniques

Target Audience

Certified Outside Plant System Design is designed for those responsible for the basic design and layout of OSP telecommunications projects or who supervise OSP installation personnel. Aimed at employees of utility companies, their sub-contractors, and end-users who design, layout, implement and construct OSP projects including “Customer Owned OSP” deployments.

PRICING COURSES & CERTIFICATIONS

TR-OSPD	*Outside Plant System Design*	**$800**
TC-OSPD	*TFS Certification OSPD*	**$150**

TR-FBE FiberBase Certified Engineer

LEVEL 2 — PREREQUISITE: NONE **3-DAY COURSE**

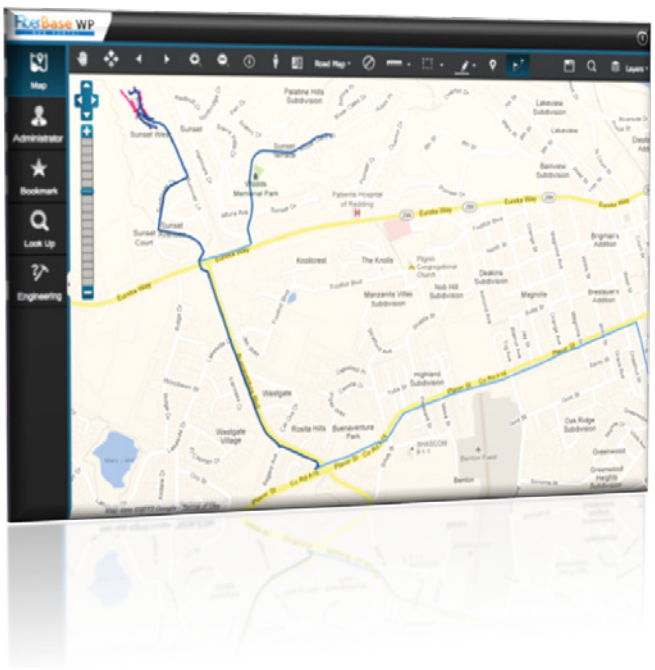
This course provides participants with the training needed to create and maintain a relational database on a fiber distribution system. Students are asked to bring a sample of what they use to document their fiber networks. On the last day of training, students will further develop their skills by using a CAD/CAM drawing of a particular room or a design drawing of a portion of their long or short haul routes between network structures.

Use FiberBase® as your document repository to quickly find important material related to your network. FiberBase® can store relevant details such as: the location of an enclosure or piece of equipment, a picture of an enclosure or a break out of what fibers terminate where. These are only a few examples of the limitless benefits of storing your business information in FiberBase®.

COURSE LECTURES TOPICS INCLUDE

- Introduction to FiberBase: Presentation Format, Course Objectives, FiberBase Components, FiberBase Configurations
- FiberBase Fundamentals: Workspaces, Toolbars and Views, Layers and Groups, Loading Equipment, Templates
- FiberBase and Fiber Topology: Long-haul Routes Between Locations, "City Level" Structure Locations, Short-haul Routes Between Locations, Splice-Point Locations, Ducts and Inner Ducts
- Building Fiber Networks in FiberBase: Sheaths and Routes, Building and Placing Equipment, Creating Floor Space, Creating Lineups, Creating Fibers from OSP Sheath through to TX/RX
- FiberBase Functionality: Linking Traces to Topology, Display the Trace View, Using Twist Factors, FiberBase Reporting, Creating Custom Reports with Crystal Reports, FiberBase and Visio
- FiberBase Review: Examination of Pre-Work, Q & A, Instructor and Classroom Survey

For more information on FiberBase go to
http://www.fiberbasenms.com/



COURSE PREREQUISITES

Those participating should have a basic knowledge of fiber and fiber optic networks. Participants will also benefit from having a good working knowledge of a graphical Windows environment.

PRICING COURSES & CERTIFICATIONS

TR-FBE	*FiberBase Engineering (Includes course materials)*	**$1,400**
TC-FBE	*TFS Certification FBE*	**$150**

TR-FBT FiberBase Certified Technician

LEVEL 3 — PREREQUISITE: NONE **4-DAY COURSE**

This four-day FiberBase Certified Technician training course provides participants with the training needed to create and maintain a relational database on a fiber distribution system. FiberBase training students are asked to bring a sample of what they use to document their Fiber networks. On the last day of training students will further develop their skills by using a CAD/CAM drawing of a particular room or a design drawing of a portion of their long or short haul routes between network structures.

Objectives

FiberBase Training will provide students with the necessary knowledge and skills:

- Build both long and short haul fiber topology rings
- Enter physical equipment
- Create custom equipment sets

Target Audience

FiberBase Training is designed for individuals entering fiber plant information into a relational database.

COURSE LECTURES TOPICS INCLUDE

- Introduction: Presentation Format, Course Objectives, FiberBase Components, FiberBase Configurations
- FiberBase Fundamentals: Workspaces, Toolbars and Views, Layers and Groups, Loading Equipment, Templates
- FiberBase and Fiber Topology: Long-haul Routes Between Locations, "City Level" Structure Locations, Short-haul Routes Between Locations, Splice-Point Locations, Ducts and Inner Ducts
- Building Fiber Networks in FiberBase: Sheaths and Routes, Building and Placing Equipment, Creating Floor Space, Creating Lineups, Creating Fibers from OSP Sheath through to TX/RX
- FiberBase Functionality: Linking Traces to Topology, Display the Trace View, Taking Advantage of Twist Factors, FiberBase Reporting

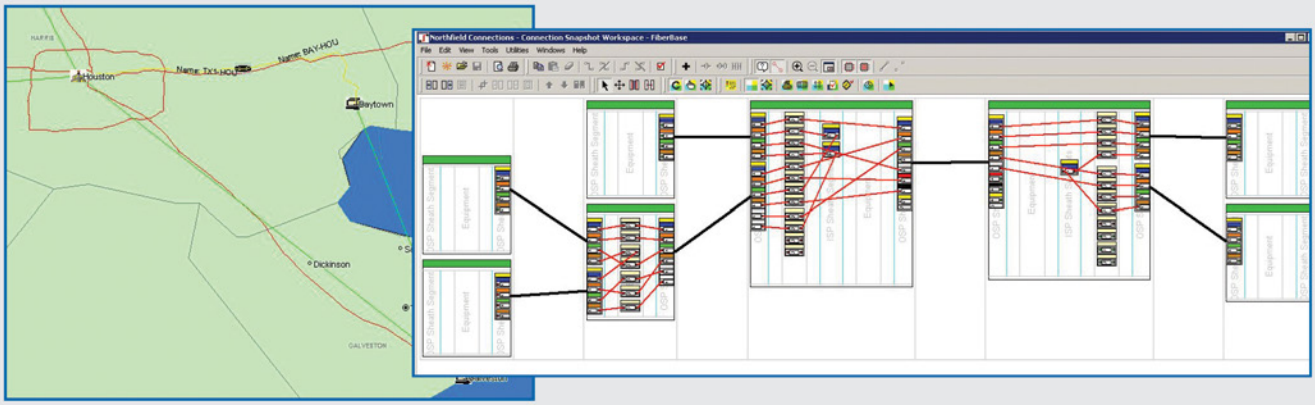
PRICING COURSES & CERTIFICATIONS

TR-FBT	*FiberBase Technician Training (Includes course materials)*	**$2,500**
TC-FBT	*TFS Certification FBT*	**$150**

COURSE PREREQUISITES

Those participating should have a basic knowledge of fiber and fiber optic networks. Participants will also benefit from having a good working knowledge of a graphical Windows environment.

TR-NAME Network Asset Management Engineer



LEVEL 2 — PREREQUISITE: NONE **3-DAY COURSE**

Network Asset Management Engineer training is a three-day course which provides participants with the training needed to create and maintain a relational database on a fiber distribution system. Students are asked to bring a sample of what they use to document their fiber networks. On the last day of training students will further develop their skills by using a CAD/CAM drawing of a particular room or a design drawing of a portion of their long or short haul routes between network structures.

Objectives

Network Asset Management Engineer training will provide students with the necessary knowledge and skills:

- Build both long and short haul fiber topology rings
- Enter physical equipment
- Create custom equipment sets

Target Audience

Network Asset Management Engineer training is designed for individuals entering fiber plant information into a relational database.

Those participating should have a basic knowledge of fiber and fiber optic networks. Participants will also benefit from having a good working knowledge of a graphical Windows environment.

COURSE LECTURES TOPICS INCLUDE

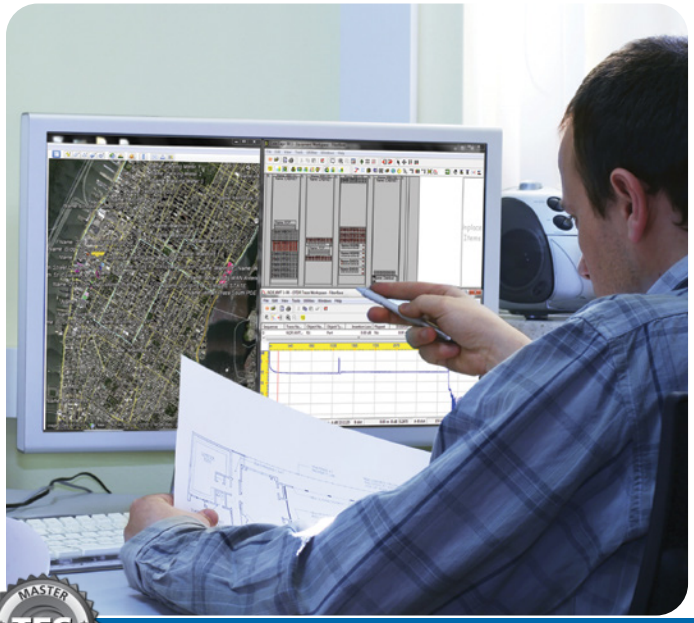
- Introduction to Network Asset Management Engineer: Presentation Format, Course Objectives, Software Components, Software Configurations
- Fiber Topology: Long-haul Routes Between Locations, “City Level” Structure Locations, Short-haul Routes Between Locations, Splice-Point Locations, Ducts and Inner Ducts
- Building Fiber Networks: Sheaths and Routes, Building and Placing Equipment, Creating Floor Space, Creating Lineups, Creating Fibers from OSP Sheath through to TX/RX
- Software: Linking Traces to Topology, Display the Trace View, Taking Advantage of Twist Factors, FiberBase Reporting, Creating Custom Reports with Crystal Reports, FiberBase and Visio
- Network Asset Management Review: Examination of Pre-Work, Q & A, Instructor and Classroom Survey

PRICING COURSES & CERTIFICATIONS

TR-NAME	*Network Asset Management Engineer*	**$1,500**
TC-NAME	*TFS Certification NAME*	**$150**

COURSE PREREQUISITES

TR-NAM Network Asset Management Technician



LEVEL 3 — PREREQUISITE: NONE **4-DAY COURSE**

Certified Network Asset Management Technician training is a four-day course which provides participants with the training needed to create and maintain a relational database on a fiber distribution system. Students are asked to bring a sample of what they use to document their Fiber networks. On the last day of training students will further develop their skills by using a CAD/CAM drawing of a particular room or a design drawing of a portion of their long or short haul routes between network structures.

Objectives

Certified Network Asset Management Technician training will provide students with the necessary knowledge and skills:

- Build both long and short haul Fiber Topology rings
- Enter physical equipment
- Create custom equipment sets

Target Audience

Certified Network Asset Management Technician training is designed for individuals entering fiber plant information into a relational database.

COURSE PREREQUISITES

Those participating should have a basic knowledge of fiber and fiber optic networks. Participants will also benefit from having a good working knowledge of a graphical Windows environment.

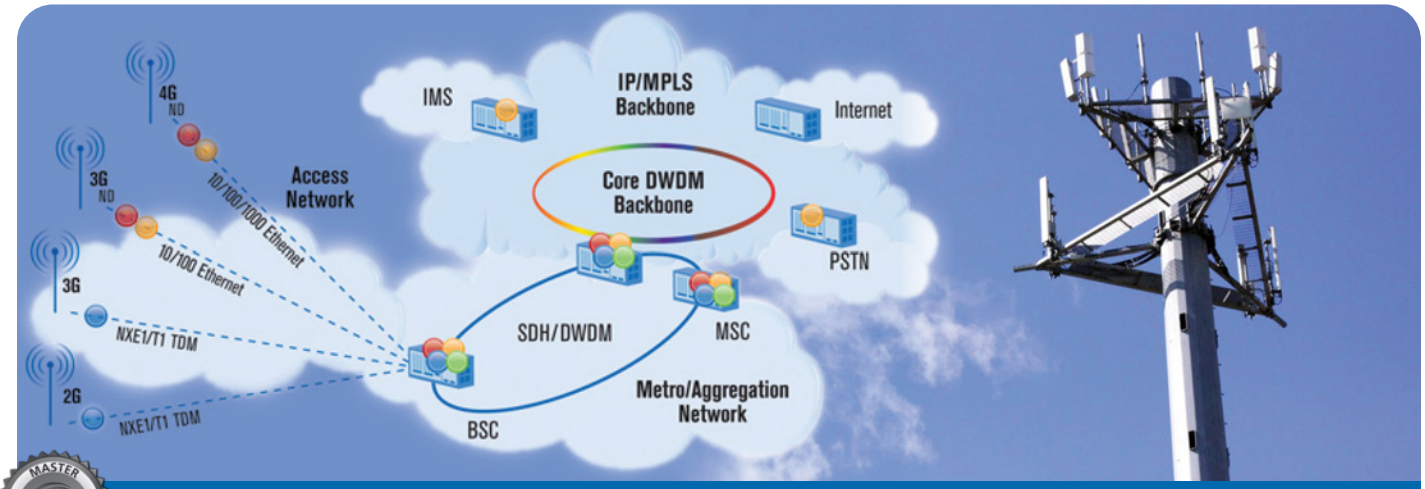
COURSE LECTURES TOPICS INCLUDE

- Introduction to Network Asset Management and Software Solutions: Presentation Format, Course Objectives, Software Components, Software Configurations
- Network Asset Management and Fiber Topology: Long-haul Routes Between Locations, “City Level” Structure Locations, Short-haul Routes Between Locations, Splice-Point Locations, Ducts and Inner Ducts
- Building Fiber Networks in an Engineering Software Package: Sheaths and Routes, Building and Placing Equipment, Creating Floor Space, Creating Lineups, Creating Fibers from OSP Sheath through to TX/RX
- Network Asset Management Software Functionality: Linking Traces to Topology, Display the Trace View, Taking Advantage of Twist Factors, FiberBase Reporting, Creating Custom Reports with Crystal Reports, FiberBase and Visio
- Network Asset Management Review: Examination of Pre-Work, Q & A, Instructor and Classroom Survey

PRICING COURSES & CERTIFICATIONS

TR-NAM	*Network Asset Management Technician*	**$2,500**
TC-NAM	*TFS Certification NAM*	**$150**

TR-EBH Ethernet Backhaul Testing



LEVEL 3 — PREREQUISITE: NONE **3-DAY COURSE**

With rising demand for mobile broadband services, network operators are seeing sharp increases in bandwidth requirements. The cellular network infrastructure must evolve to support newer technologies that require more and more bandwidth. Mobile service providers need to gain real-time, insight into their network performance in order to manage existing architectures and ensure a higher quality of service regardless of the underlying technology.

Cellular networks may face challenges such as:

- Quality of Service(QoS)
- Testing multiple technologies – Ethernet, SONET
- SLA's
- Tracking and validation
- Network monitoring
- Cost of Network Expansion

COURSE LECTURES TOPICS INCLUDE

- History: mobile services and the need for mobile backhaul
- Network architecture and infrastructure of wireless communications
- Review: Open Systems Interconnection (OSI) Reference module and identifying the functions of each layer
- Overview: Transmission Control Protocol (TCP) and User Datagram Protocol (UDP)
- Primary Transport service s (DsN Ethernet)
- Time Division Multiplexing (TDM), DsN and Sonet
- Sonet and DsN Frame structure, testing requirements (Bert, RTD, Service Disruption, network monitoring etc)
- Ethernet 802.3 basics (Frame structure, flow control, ARP VLANS etc)
- Testing Standards RFC2544 and ITU-T Y.1564. (Packet jitter, sequence testing, latency, throughput, frame loss etc)
- Testing for SLA's

For current locations and dates go to
http://www.thefiberschool.com/schedule

COURSE LABS HANDS-ON

- Certification tests
- Testing in the Telco Environment

PRICING COURSES & CERTIFICATIONS

TR-EBH	*Ethernet Backhaul Testing (Includes course materials)*	**$2,500**
TC-EBH	*TFS Certification EBH*	**$150**

TR-GBE Gigabit Ethernet

Upgrade to Gigabit Networking
FOR BETTER...
PERFORMANCE

Junos Certification Boot Camp provides you with all the aspects that meet that Junos Specialist Certification tier for the Enterprise Network Engineer... all in one easy package!

LEVEL 3 — PREREQUISITE: NONE **3-DAY COURSE**

Gigabit Ethernet training by The Fiber School is a two-day course that provides students with a detailed understanding of the capabilities of Gigabit Ethernet. Intended for Sales Engineers, Testers, Installers, Managers and other professionals, this course is useful for those who need to plan, design, implement and test the new generation of Ethernet.

This is an area that is growing rapidly within the telecommunications industry. Over the next several years, enterprises are gearing up to adopt Gigabit Ethernet as a switch-to-switch interconnect technology. Potentially, Gigabit Ethernet can also be used for long-distance backbone connections in large campuses, or for building out MANs where dark fiber is available.

Objectives

This course covers:

- A Brief History of Ethernet
- 1, 10, 40 and 100-Gigabit Ethernet Overview
- Benefits of Gigabit Ethernet
- Market Requirements
- Protocol Layer
- Gigabit Ethernet Physical and MAC Layers
- MAC Frame Format

Target Audience

This course is suitable for Engineers, Technicians, Sales professionals or Marketing experts. Much more than an overview, this class provides a thorough understanding of Gigabit Ethernet: its protocol, core functionality, various options and error recovery strategies.

COURSE PREREQUISITES

Students will benefit from a basic understanding of data communications and networking.

For current locations and dates go to
http://www.thefiberschool.com/schedule

COURSE LECTURES TOPICS INCLUDE

- Introduction To Ethernet: 100BASE-T, 10-Gigabit Ethernet, Objective of 10G Ethernet, Overview of 802.3ba (40/100 Gb/s)
- Gigabit Ethernet: Architecture, MAC Layer, Physical Layer, Gigabit Ethernet in LAN, MAN & WAN, Advantages and Disadvantages, Future market of 10G Ethernet
- Differences between Gigabit Ethernet and other speeds of Ethernet
- Gigabit Ethernet Protocols: Ethernet Media Access Control (MAC) Interfaces, Ethernet Physical Coding Sublayer (PCS) Interfaces, Serial Interfaces, Physical Medium Attachment and Dependent, Media Independent Interfaces
- Gigabit Ethernet Testing and Analyzing: Full-bandwidth capture, Slicing and filtering, Configurable event trigger, Protocol Decoding, Statistical Analysis, Bit Error Rate (BERT) analysis, Bus-specific triggering, Bus-specific filtering, Ultra-deep Memory, Command-Level, State-Level, Histogram Displays, Timing Mode, State Mode, Capture Errors, Ethernet/ARP/LLC, IP Gigabit Ethernet, Multimode Interface, IP/ICMP, TCP, UDP, Supporting iSCSI
- Migration to Gigabit Ethernet: Related Standards, IEEE 802.1p, Generic attribute registration protocol (GARP), GARP multicast registration protocol (GMRP), GARP VLAN registration protocol (GVRP), IEEE 802.1Q, IEEE 802.3x, Operation of IEEE 802.3x Flow Control, IEEE 802.3ab
- Gigabit Ethernet Products: Case Studies, The Marketplace, Vendors, Trends

PRICING COURSES & CERTIFICATIONS

TR-GBE	*Gigabit Ethernet Training (Includes course materials)*	**$2,000**
TC-GBE	*TFS Certification GBE*	**$150**

TR-GET 40/100 Gigabit Ethernet

LEVEL 3 — PREREQUISITE: NONE **3-DAY COURSE**

40/100 Gigabit Ethernet training covers all aspects of the 802.3ba-2010 in regards to implementation of 40/100 GbE AKA IEEE 802.3ba . It provides two implementations – 40 GbE with four 10 GbE links (or lanes), or 100 GbE with ten links. An additional standard that uses 25 GbE links is currently under development. The main focus of the 100 GbE is "Data Centers" that need to manage huge amounts of data.

Objectives

This course covers:

- The basic Definitions of Gigabit Ethernet
- Understand the basics of Media Access Control Parameters, Physical Layers, and Management Parameters for 40 Gb/s and 100 Gb/s Operation
- Detailed Architecture and operation of 10, 40 and 100 Gigabit Ethernet
- Gigabit Ethernet Media Access Control (MAC) Interface Description
- Gigabit Ethernet Physical Coding Sublayer (PCS) Interfaces
- Gigabit Ethernet Physical Medium Attachment (PMA) Interfaces
- Details regarding the implementation and operation of the Gigabit Ethernet
- Test, verify and validate Gigabit Ethernet implementation

Target Audience

40/100 Gigabit Ethernet training is designed for Engineers, Sales and Marketing and Managers.

COURSE PREREQUISITES

Students will benefit from a basic understanding of data communications and networking or Gigabit Ethernet training (TR-GBE).

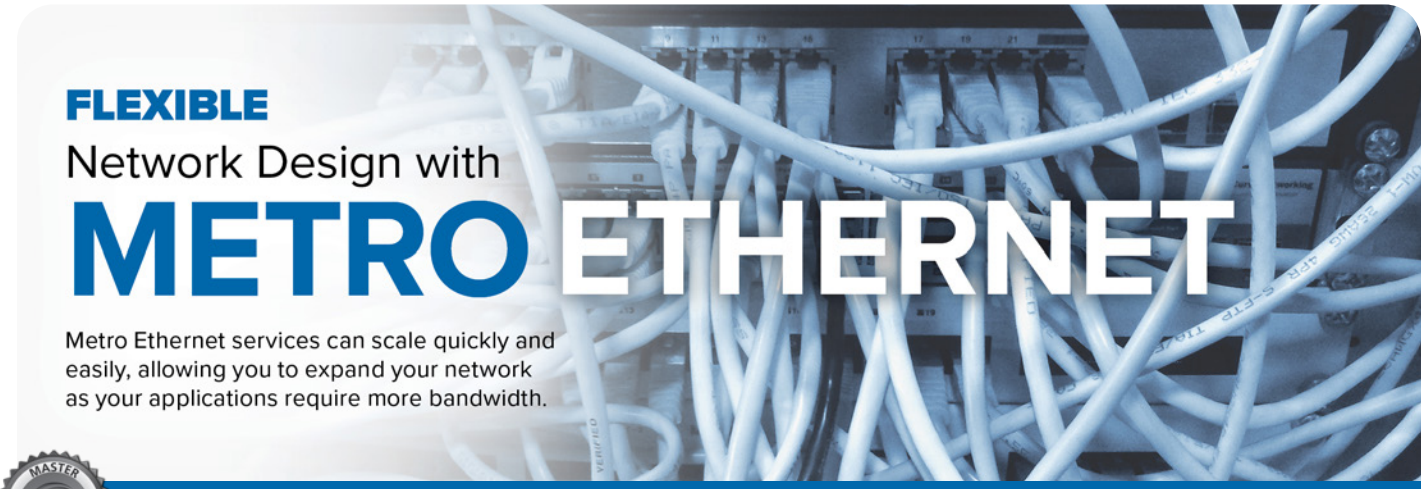
COURSE LECTURES TOPICS INCLUDE

- Introduction - Course Objective
- Gigabit Ethernet Definitions: Media Access Control, MAC parameters, Management, Management Data Input/Output (MDIO) Interface, MDIO Interface Registers, Physical Medium Dependent (PMD)
- Ethernet operation over electrical backplanes
- Physical Layer signaling systems
- Forward Error Correction (FEC) sublayer for BASE-R PHYs
- Functional block diagram for 10GBASE-R PHYs, 40GBASE-R,100GBASE-R PHYs
- FEC service interface
- Auto-Negotiation for backplane and copper cable assembly
- Introduction to 40 Gb/s and 100 Gb/s networks: Physical Layer signaling systems, 40 Gigabit and 100 Gigabit Ethernet sublayers, Reconciliation Sublayer (RS) and Media Independent Interface, Physical DCoding Sublayer (PCS), PMA and PMD sublayers
- XLGMII and CGMII: XLGMII/CGMII structure, Mapping of XLGMII/CGMII signals to PLS service primitives, XLGMII/CGMII data stream, XLGMII/CGMII functional specifications
- Details of 40 Gb/s and 100 Gb/s Implementation, Testing, Verification, Validation and IP: PCS, 64B/66B transmission code, Transmit Process, PMSA, PMD

PRICING COURSES & CERTIFICATIONS

TR-GET	*40/100 Gigabit Ethernet Training (Includes course materials)*	**$2,000**
TC-GET	*TFS Certification GET*	**$150**

TR-MET Certified Metro Ethernet for Tech Professionals



LEVEL 3 — PREREQUISITE: NONE **3-DAY COURSE**

Metro Ethernet training from The Fiber School covers concepts and technologies behind Metro Ethernet including Layer 2 virtual private network (VPN), Ethernet deployment solutions, Ethernet Relay Service (ERS), Ethernet Wire Service (EWS), Ethernet Multipoint Service (EMS), Layer 2 VPNs over Multi protocol Label Switching (MPLS),and combination single and distributed provider edge solutions.

Objectives

This course covers:

- Relate the importance of Metro Ethernet Switching to service-provider markets
- Describe, plan, configure, and troubleshoot Metro Ethernet deployment solutions
- Identify configuration differences between the Layer 2 Metro Ethernet Switching service implementation and Layer 3 MPLS
- Implement the features and functions of platforms supported by Metro Ethernet Switching, including VLAN IDs, Spanning Tree, quality of service (QoS) mechanisms, and network resiliency and security
- Understand mechanisms for QoS and Security over Metro Ethernet Networks
- Understand Ethernet services delivery mechanisms Over MPLS and provider backbone transports

Target Audience

This course is intended for those who design Metro Ethernet Switching solutions for service providers or those who implement end-to-end Metro Ethernet Switching services and/or deploy networks Metro Ethernet Switching services.

COURSE PREREQUISITES

Students should have a good understanding of IP and WAN principles and a basic understanding of data communications and networking.

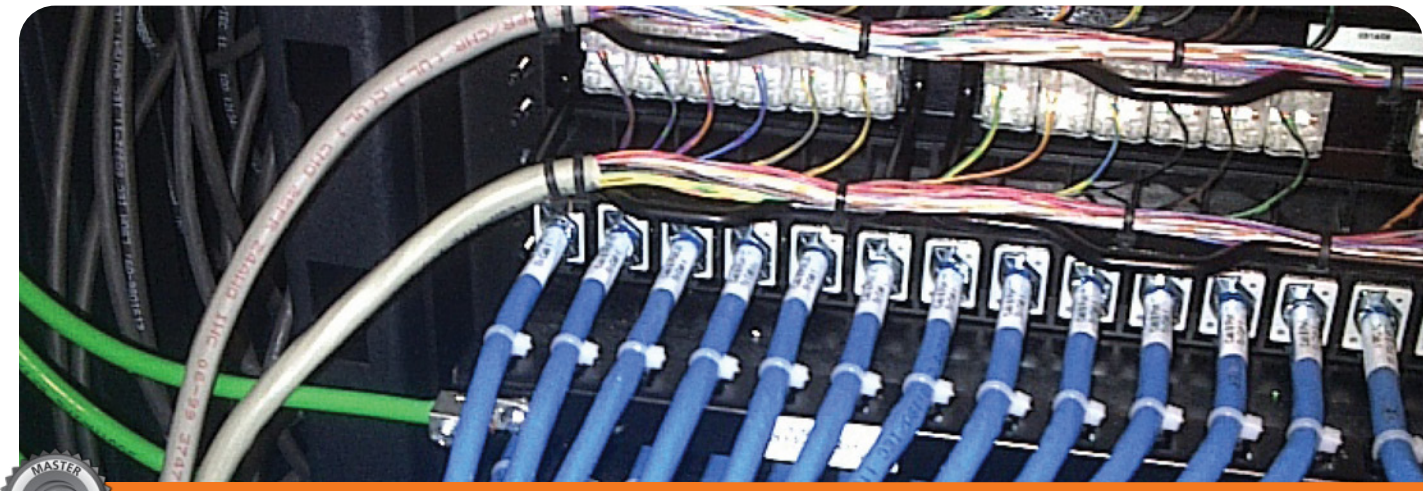
COURSE LECTURES TOPICS INCLUDE

- Introduction: Course Objective
- Metro Ethernet Basics: Basics of Ethernet switching, Bridging functions, 802.1d Spanning Tree and Rapid Spanning Tree, Metro Ethernet Overview, Software Features, Components, Ethernet Services Model (ESM), VLANS
- Carrier Ethernet Services: Access, Distribution (Aggregation), Edge and Core Network Deployments, Access Networks, Carrier Ethernet Aggregation, Aggregation Network
- Overview of Metro Ethernet: Native Ethernet, Ethernet as a Carrier-Grade technology, Ethernet-based backhaul solutions, Deploying and maintaining carrier Ethernet Services Layer 2 virtual private network (VPN), Ethernet relay service (ERS), Ethernet wire service (EWS), Ethernet multipoint service (EMS), Link access procedure (LAPS), Over IP AND MPLS, 100GbE
- Metro Ethernet Service Definitions
- Metro Ethernet Transport Methods: Resilient Packet Rings (RPR), Hybrids, Optical Ethernet, High-Speed Ethernet and Other Technologies, 10 Gb/s Ethernet, Switched Ethernet, Wireless Ethernet, Ethernet-Over-VDSL
- Metro Ethernet Network Architecture
- Metro/Carrier Ethernet Backhaul: Network Design Considerations, Network Planning, Technology and Operations
- Pure Metro Ethernet
- SONET/SDH-Based Metro Ethernet
- Metro Ethernet Implementation
- Overview of MPLS-TP (Transport Profile of MPLS)

PRICING COURSES & CERTIFICATIONS

TR-MET	*Certified Metro Ethernet for Technical Professionals (Includes course materials)*	**$3,000**
TC-MET	*TFS Certification MET*	**$150**
TC-MEF-MET	*MEF CECP 2.0 Certification*	**$350**

TR-CONT Certified Optical Network Technician



LEVEL 3 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **24 HOURS** of online instruction

This 3-day course provides an excellent overview of the complex field of optical networking. This course ties the optical hardware functionality into the overall networking picture. This course is a valuable reference for both practitioners and researchers.

Objectives

This course provides an introduction to optical networking and the types of systems that are in widespread commercial deployment. This course will provide you with a complete technical foundation on today's key networking technologies allowing technicians to fully understand the inter-workings of an optical network that will aid in the installation and maintenance of the optical network.

Target Audience

This course is designed to provide a good technical overview for technical managers, consultants, communication professionals, networking professionals, system engineers, NOC technicians, and others who plan on using, evaluating or working with optical networks. It's also applicable to engineers and technicians responsible for maintaining, monitoring, and optimizing optical systems.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Networking Basics, Fiber Optic History, Fiber optic advantages and Applications, Light Propagation
- Introduction to Optical Networks: Network architects, circuit switching, packet switching, transparency and the all optical network, transmission Basics, networks Evolution
- Fiber Types: G.652, G.653, G.655 and there effects on design
- Components: Transmitters, receivers, attenuators, switches, amplifiers, multiplexers, DCMs, OADM
- Propagation of Signals: Attenuation, intermodal dispersion, chromatic dispersion, polarization mode dispersion, nonlinear effects, link power budget, optical return loss, four wave mixing, cross phase modulation.
- Technologies: CWDM, DWDM, Ethernet, Sonet, OTN, ROADMS, modulation and advanced modulation schemes
- Physical Layer Troubleshooting: Attenuation, ORL, dispersion, reflectance, breaks
- Testing Requirements: OTDR, Fiber Inspection, Chromatic Dispersion, Polarization mode dispersion, ORL, Loss, GigE (RFC-2544 – Y.1654) Sonet (Bert, Continuity, RTD, frequency offset, fiber path identification)

PRICING COURSES & CERTIFICATIONS

TR-CONT	*Certified Optical Network Technician*	**$3,000**
TC-CONT	*TFS Certification CONT*	**$150**

TR-CONE Certified Optical Network Engineer

LEVEL 3 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **32 HOURS** of online instruction

This course ties the optical hardware functionality into the overall networking picture. This course is a valuable reference for both practitioners and researchers. The Fiber School's 4-day Certified Optical Networking Engineer training is the answer to your professional training. Whether you require an understanding existing network architecture or next generation network design, we articulate the mission critical demands of today's telecom systems.

With today's ever increasing bandwidth consumption multiple services are now running across the fiber at increased transmission rates. This course provides you with a complete technical foundation by providing an overview of today's key networking technologies. Knowing the latest technologies will aid in the designing, planning and operation of your network.

Target Audience

This course is designed to provide a good technical overview for Technical Managers, consultants, communication professionals, networking professionals, system engineers, NOC technicians, and others who plan on using, evaluating or working with optical networks. It is also applicable to engineers and technicians responsible for maintaining, monitoring, and optimizing optical systems.

COURSE PREREQUISITES

Some prior knowledge of electromagnetics and a comprehensive understanding of communication networks.

COURSE LECTURES TOPICS INCLUDE

- Introduction to Optical Networks: Network architects, circuit switching, packet switching, transparency and the all optical network, transmission basics, networks evolution
- Propagation of Signals: Attenuation, intermodal dispersion, chromatic dispersion, polarization mode dispersion, nonlinear effects
- Components: Couplers, isolators, multiplexers, optical amplifiers, transmitters, detectors, switches, wavelength converters
- Modulation: Subcarrier modulation and multiplexing, demodulation, spectral efficiency, FEC, DQPSK.
- Transmission System Engineering: System Model, Power Penalty, Transmitter, receivers, amplifiers, fiber types, attenuation, Optical Return Loss, Chromatic Dispersion, Polarization mode Dispersion, Non-linear effects, crosstalk
- Networks: Sonet/SDH, Optical Transport Networks, Next Gen Sonet (GFP,LCAS VCAT), Ethernet, MPLS, 100GigE with coherent detection, DWDM, ROADMs
- DWDM and High Speed Impairments: efficiency, bandwidth and/or distance limitations, chromatic dispersion, Polarization mode dispersion, Chromatic dispersion, OSNR, nonlinearities

PRICING COURSES & CERTIFICATIONS

TR-CONE	*Certified Optical Network Engineer*	**$4,000**
TC-CONE	*TFS Certification CONE*	**$150**

TR-ONT Optical Networking

LEVEL 3 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **32 HOURS** of online instruction

The Fiber School's Optical Networking training is the answer to understanding Optical Networks technology. Exploring both public and private networks, our mission is to clarify highly-complex technical standards pertaining to the design and implementation of optical networks, with an emphasis on achieving optimum performance.

Objectives

With the advent of multiservice transport platforms (MSTPs) and new reconfigurable add-drop multiplexers (ROADMs)— engineers and technicians must not only perform traditional tests, but are now also responsible for verifying packet-based services such as Ethernet, 10 Gigabit Ethernet, 100 GigE, OC-768, Fiber Channel all running over the same network elements. Furthermore additional testing is needed at the physical layer to verify the fiber can support these services. This course provides you with a complete technical foundation for installing, maintaining and troubleshooting today's networks through the use of hands on testing.

Target Audience

This 4-day course is designed to provide a good technical overview for technical managers, consultants, communication professionals, networking professionals, system engineers, network engineers, Tier 1 -3 technicians, NOC technicians, and others who plan on using, evaluating or working with optical networks. It is ideal for engineers and technicians that are responsible for installing, maintaining, monitoring, and optimizing optical systems.

COURSE PREREQUISITES

Students will benefit from a having taken Certified Optical Network Technician (TR-CONT) or Certified Optical Network Engineer (TR-CONE).

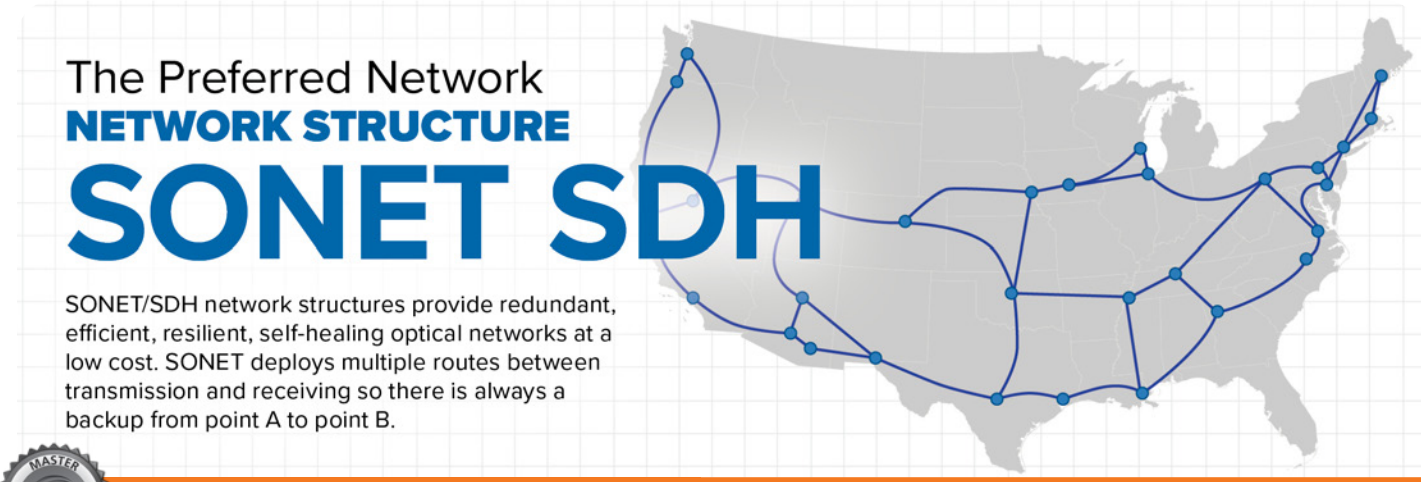
COURSE LECTURES TOPICS INCLUDE

- Introduction to Fiber Optics: Networking Basics, Fiber Optic History, Fiber optic advantages and Applications, Light Propagation
- Network Evolution: 1st Generation optical networks, 2nd Generation Networks, evolving networks, all optical networks.
- Light Transmissions: Optical sources, receivers, amplifiers, modulation, fiber types, attenuation, Optical Return Loss, Chromatic Dispersion, Polarization mode Dispersion, Non-linear effects, OSNR
- Technical Details of Optical Communications: The Nature of Light, Light as an Electromagnetic Wave (Photons, Polarization, Interference), Physics of Optics, Fiber Optics Networks Design
- Testing Networks: Hands on testing of DWDM, Sonet, OTN, GigE, 10GigE, 100GigE, Physical Layer testing consisting of OTDR, Loss, ORL, Connector inspection, chromatic dispersion, polarization mode dispersion, etc.
- Test Standards and Methodologies: RFC-2544, ITU-T Y.1564, RFC -6349, TIA-455-124 – FOTP124, FOTP-175 / TIA-455-175-B, FOTP-171 / EIA-455-171

PRICING COURSES & CERTIFICATIONS

TR-ONT	*Optical Networking (Includes course materials)*	**$5,000**
TC-ONT	*TFS Certification ONT*	**$150**
TR-ONT-L	*Instructor Lead / Classroom Option*	**$500**

TR-STC SONET SDH



LEVEL 3 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **16 HOURS** of online instruction

SONET SDH self-healing rings are the most common network architecture because of its relatively simple implementation and easy management.

In normal use, traffic is dispatched in the direction of the shortest path towards its destination. In the event of the loss of a link, or of an entire station, the two nearest surviving stations "loop back" their ends of the ring. In this way, traffic can still travel to all surviving parts of the ring, even if it has to travel "the long way round".

Self-healing rings offer high levels of resilience at low cost, since it is often geographically easy to take multiple paths across the landscape and link them up into a ring with a small amount of extra fiber length.

Objectives

This course covers:

- Understand Digital Voice & Plesiochronous Digital Hierarchy
- Understand Transmission Hierarchies
- Understand Digital Network Synchronization
- Explore Benefits and Features of SONET/SDH
- Compare and Contrast STS-1 SPE and AU-3
- Understand Automatic Protection Switching (APS)
- Understand Add/Drop Multiplexers (ADMs)
- Understand Digital Cross-Connects (DCCs)
- Explore the evolution of Timing and Synchronization
- Understand SDH and Tributary Multiplexing

Target Audience

This 2-day course is designed for Technical Managers, Consultants, Communications Professionals, Software Engineers, System Engineers, Network Professionals, and IT Professionals.

COURSE PREREQUISITES

Students should have a basic understanding of computer networks and the OSI model.

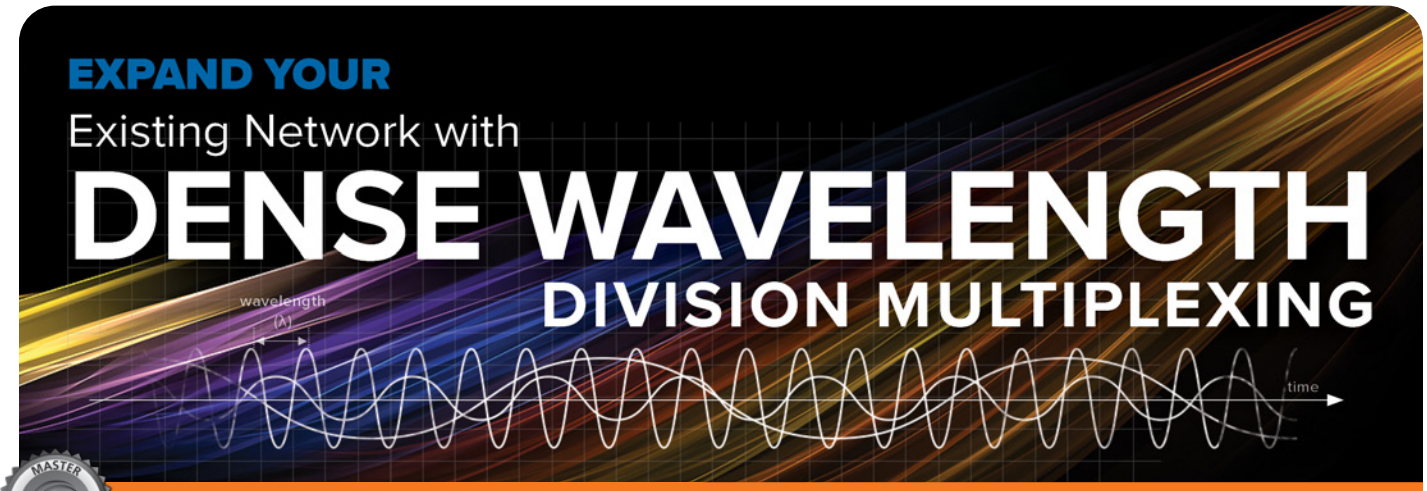
COURSE LECTURES TOPICS INCLUDE

- Digital Voice and Plesiochronous Digital Hierarchy (PDH): Digital Network Synchronization, Network Timing & Synchronization Concepts, PDH Relationships and Network Elements, Frequency Justification, Limitations of PDH
- SONET/SDH Protocols and Concepts: Benefits and Features of SONET/SDH, Evolution from PDH to SONET/SDH Plesiochronous Networks, Building-Block Signals, Unifying SONET and SDH, Frame Structures, Overhead Functions, Pointer Errors
- SONET/SDH Path Overhead and Payload Mappings: Compare and Contrast STS-1 SPE and AU-3, Compare and Contrast STS-3c SPE and AU-4, DS-3 Mapping into STS-1 SPE and VC-3, E-4 Mapping into STS-3c SPE and VC-4 TUG-3 and TU-3, Virtual Tributary / Tributary Unit Group, Pointers and Payload Mappings, Tandem Connections, ATM Cell Mapping, Packet over SONET Mapping, 10G Ethernet over SONET, Limitations of Octet HDLC in High Bit Error Ratio (BER) Environments, Simplified Data Link (SDL) Protocol
- SONET/SDH Network Elements and Applications: Terminal Multiplexers (TMs), Functional Block Diagram of TMs, Functional Block Diagram of ADMs, Next Generation Digital Loop Carrier (NGDLC), SONET/SDH Interfaces on Switches and Routers
- Synchronizing SDH and SONET
- SONET/SDH Multiplexing

PRICING COURSES & CERTIFICATIONS

TR-STC	*SONET SDH Training Course*	**$2,000**
TC-STC	*TFS Certification STC*	**$150**
TR-STC-L	*Instructor Lead / Classroom Option*	**$500**

TR-DWM Dense Wavelength Division Multiplexing (DWDM)



LEVEL 3 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **24 HOURS** of online instruction

DWDM training provides an overview of Dense Wavelength Division Multiplexing (DWDM) network planning, architecture, design, protocols, testing and implementation.

Objectives

This course covers:

- Understand the basics of optical communications
- Understand the basics of DWDM
- Explain basic DWDM Network Designs and Engineering
- Identify various optical communication principles as well as communication methodologies in an optical fiber
- Learn how to analyze optical links based on power budget
- Design DWDM networks based on size and performance
- Understand the basic design nodal architectures for different classification of DWDM networks
- Learn how to utilize different parameters in DWDM networks and optical systems

Target Audience

This 3-day course is designed to provide a general overview for strategic or technical managers, consultants, communications professionals, software engineers, system engineers, network professionals, marketing and sales professional, IT professionals, and others who plan on using, evaluating, designing or working with SONET/SDH, DWDM and optical networks.

COURSE PREREQUISITES

Students will benefit from a having basic understanding of telecommunications.

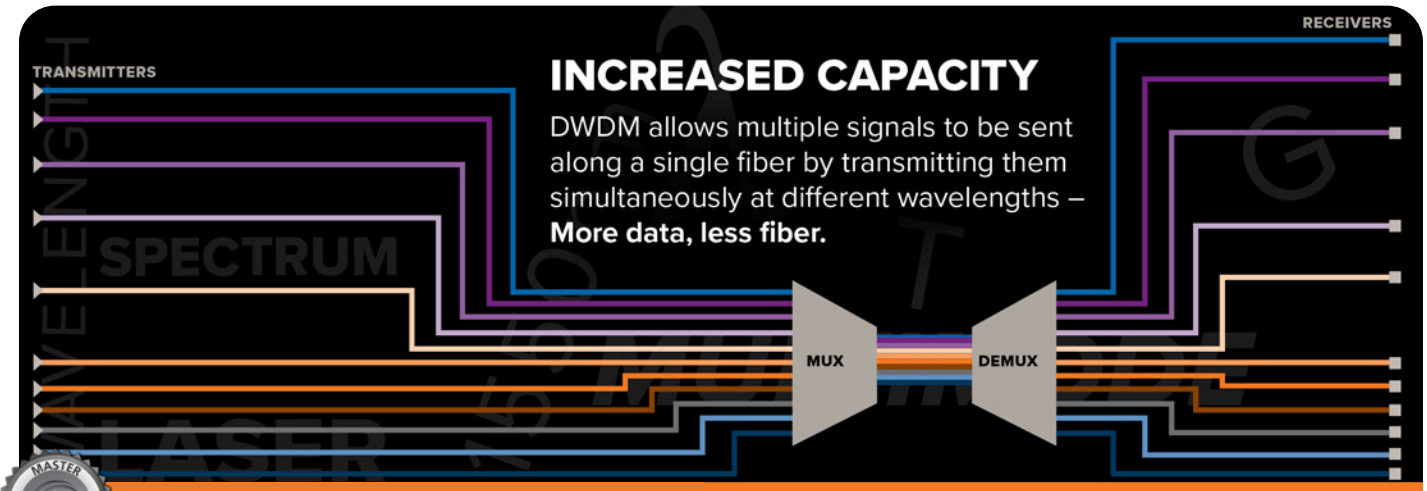
COURSE LECTURES TOPICS INCLUDE

- Introduction to Optical Networking: Fiber Optics, Fiber Losses, Dispersion in Fiber, Nonlinearities, Window of Operations, Fiber Types, Optical amplifiers, Light sources and Transmitters, Photodiodes and receivers, Optical communication systems, The physics of Optical Components, Light-Matter and Light-Matter-Light
- Common Single Mode Fiber Types: Standard Single Mode Fiber, Dispersion Shifted Fiber (DSF) Dispersion-compensating fiber (DCF), Non-Zero Dispersion Shifted Fiber (NZ-DSF), Positive Dispersion SMF, Dispersion Compensation Unit (DCU)
- Introduction to DWDM: Optical Networking and DWDM, Optical Network Breakthroughs, Special Fibers, Optical Components, Optical Spectral Filters and Gratings, Optical Demultiplexers, The Erbium-Doped Fiber Amplifier (EDFA), The Tunable Laser Diode Operating at 1550nm, Light Sources
- DWDM Components and Architecture: DWDM Anatomy, DWDM Impairments, Multiwavelength Transmitters, Multichannel Receivers, DWDM Optical Amplifiers, Wavelength Converters, Modal Effects, Scattering Effects,
- DWDM Impairments: Availability, Occupancy, Efficiency, Bandwidth & Distance Limitations, Chromatic Dispersion, Polarization Mode Dispersion (PMD), Noise, Dispersion, Nonlinearities, Four Wave Mixing (FWM)
- Wavelength Adaptation
- Basic DWDM Optical Components and Elements
- DWDM Mux and Demux Technology
- Networking with DWDM
- Span Engineering, Testing, Measurements and OAM&P

PRICING COURSES & CERTIFICATIONS

TR-DWM	*DWDM Training - Basics*	**$2,000**
TC-DWM	*TFS Certification DWM*	**$150**
TR-DWM-L	*Instructor Lead / Classroom Option*	**$500**

TR-DWA DWDM - Advanced



LEVEL 3 — PREREQUISITE: NONE | ONLINE SELF-PACED COURSE | 16 HOURS of online instruction

This 2-day course provides an advanced technical overview of DWDM training and optical networking concepts. One of the major issues in the networking industry today is the rapidly increasing demand for greater bandwidth. With the development of optical networks and the use of Dense Wavelength Division Multiplexing (DWDM) technology, a new and crucial milestone is being reached.

Objectives

This course covers:

- Understand advanced optical communications topics
- Explain advanced DWDM Network Designs and Engineering
- Maintain and evaluate optical components in DWDM networks
- Learn about the effects of noise in signal propagation, especially from OSNR and BER perspectives
- Maintain optical amplifier-based links
- Learn how to maintain optical links based on power budget, dispersion and nonlinearities
- Maintain optical links based on OSNR
- Classify and maintain DWDM networks based on size and performance
- Learn how to test and measure different parameters in DWDM networks and optical systems

Target Audience

This course is designed for strategic or technical managers, consultants, communications professionals, software engineers, system engineers, network professionals, marketing and sales professional, IT professionals, and others who plan on using, evaluating or working with DWDM and optical networks applications and services.

COURSE PREREQUISITES

Students should have completed Dense Wavelength Division Multiplexing (DWDM) (TR-DWM) or 5 years of network administration.

COURSE LECTURES TOPICS INCLUDE

- DWDM Components and Architecture: Anatomy, Impairments, Multiwavelength Transmitters, Multichannel Receivers, DWDM Optical Amplifiers, Wavelength Converters, Model Effects, Scattering Effects
- DWDM Impairments: Spectrum, Availability, Occupancy, Efficiency, Bandwidth & Distance Limitations, Noise, Dispersion, Nonlinearities, Four Wave Mixing (FWM), Cross-phase Modulation (XPM), Stimulated Brillouin Scattering (SBS), Stimulated Raman Scattering (SRS), Chromatic Dispersion (CD), Polarization Mode Dispersion (PMD), Amplified Spontaneous Emission (ASE), Modeling of Nonlinearities, Noise-like penalties, Illustrations with System Examples, Optical Power Damage Threshold, Fiber, Components, Noise Sources, Not-Return-to-Zero (NRZ) vs. Return-to-Zero (RZ) Transmission, Dispersion and PMD Compensation, The Effects of Optical Crosstalk
- Analysis of Optical Components: Limits common to all optical components, Optical Filters, Couplers, Power Attenuators, Polarizer and Rotators, Beam Splitters, Light Sources, Ring Resonators
- EDFA Details: Advantages, EDFA Disadvantages, Limited to C and L bands, Pump Laser, Erbium Doped Fiber, Wavelength Selective Coupler, Isolator, A Comparison between EDFE, Raman Amplifier and SOAs
- Networking with DWDM
- DWDM Span Engineering: Engineering a DWDM link, Power Budget Design, Digital Modulation Formats, Fiber Impairments, Loss, Dispersion
- DWDM Testing, Measurements and OAM&P

PRICING COURSES & CERTIFICATIONS

TR-DWA	*DWDM - Advanced*	**$2,000**
TC-DWA	*TFS Certification DWA*	**$150**
TR-DWA-L	*Instructor Lead / Classroom Option*	**$500**

TR-RFF Radio Frequency (RF) Fundamentals

LEVEL 1 — PREREQUISITE: NONE **2-DAY COURSE**

The Radio Frequency Fundamentals training course is designed for people who work in the field of radio frequency communications, as well as those who require a basic understanding of RF fundamentals. The Fiber School provides high-quality radio frequency training programs for government agencies, small businesses and Fortune 500 companies. Our RF courses are specifically designed by experts in the field, and the course materials are continuously updated with the latest techniques and industry best practices.

The RF Training Fundamentals course covers the basics of RF theory such as propagation modeling, link budget, modulation, channel coding, antennas, capacity planning, propagation, frequency planning and optimization.

Objectives

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring device operations.

This course covers:

- RF Overview
- RF Technologies and Deployment
- Types of RF Propagation Models and Their Uses
- Link Budget Calculations
- Antenna Theory
- Basic Principles of Traffic Engineering and Optimization
- RF System Design Considerations
- RF Regulatory Considerations

Target Audience

The Radio Frequency Training course is designed for anyone needing a solid foundation for understanding the principles of RF Engineering. Engineers, technicians and managers who are new to RF and require applicable skills in RF design, planning and engineering.

Anyone working within the field of general RF systems, wireless, cellular and microwave systems will benefit from this comprehensive coverage of RF fundamentals.

COURSE LECTURES TOPICS INCLUDE

- Introduction – Course Objectives
- History of RF
- Characteristics of a Radio Signal
- Building Blocks in Radio Design
- Technology Fundamentals
- Cellular and Mobile RF
- Fixed Wireless RF
- Radio Propagation
- Introduction to Microwaves
- Frequency Bands Signal Principles
- Physics and Propagation Mechanisms
- Reliability of Service: Using stats to design for reliability
- Basic Antennas: Isotropic and Dipole radiators
- Horizontal arrays: yagis, log-periodics, etc.
- Bandwidth Limitations
- Dynamic Range
- Intermodulation Distortion
- Power Output
- Spectral Efficiency and System Limitations
- Sample Link Budget Calculations

PRICING COURSES & CERTIFICATIONS

TR-RFF	*Radio Frequency Fundamentals*	**$10,000**
TC-RFF	*TFS Certification RFF*	**$150**

TR-RFA Radio Frequency (RF) – Advanced

LEVEL 2 — PREREQUISITE: TR-RFF **2-DAY COURSE**

The Advanced RF training course is an interactive, hands-on program intended for anybody working with Radio Frequency (RF) communications, who requires a technical level of advanced RF principles. RF principles are employed in various communication technologies, such as Microwave, SATCOM, VSAT, GSM, GPRS/EDGE, CDMA, UMTS, HSPA+, LTE, LTE-Advanced, WiFi, Bluetooth, Zigbee, RFID, NFC and more.

Objectives

This course will provide students with an understanding of all the aspects of Radio Frequency — From the basics of RF planning, to advanced topics in system design, specifications, and performance.

Target Audience

Technical personnel involved with RF system design/operations, engineers and managers engaged in (or expecting to be engaged in) the specification, procurement, design and development, testing, and operation of current and future RF systems.

COURSE PREREQUISITES

Basic mathematical and computing skills are recommended for this course. An electrical engineering background or equivalent practical experience is desired, but not required.

COURSE LECTURES TOPICS INCLUDE

- **RF System Design and Engineering Principles:** Overview of RF Systems; HF, VHF and UHF Radio Systems, including Analog, Digital and Trunk; RF System Design and & Integration; Modulation Techniques; RF Testing and Measurement
- **RF Systems Simulation and Behavioral Modeling:** RF Modeling; Spectral efficiency vs Power Efficiency; Antenna Types; Link Budget Calculations; Noise Figure; Receiver Sensitivity; Dynamic Range; Intermodulation Distortion; Scattering Parameter Analysis; RF Regulatory and Safety Considerations
- **Practical RF System Design Guidelines:** Basic Building blocks in radio and microwave design; tradeoffs in designing wireless systems; Noise and distortion; Low noise amplifiers and mixers; oscillators/phase noise; forward error correction
- **RF Transmitters/Receivers:** circuit and system level design; typical radio architectures; antenna design considerations
- **Evaluation system specifications and performance:** Real-time coverage maps; Test plan development; Cell site integration
- **EM Shielding/EMC Engineering:** Understand Shielding Mechanisms and Problems; EMC/Shielding/Grounding Techniques for Chip & PCB Layout; EMC Design, Bench Top Measurements and Troubleshooting Techniques; Successful Shielding Strategies

PRICING COURSES & CERTIFICATIONS

TR-RFA	*Radio Frequency – Advanced*	**$18,000**
TC-RFA	*TFS Certification RFA*	**$150**

TR-STD-HFC Healthcare Facilities

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standard & Codes presentation is for use in the design and implementation of the ICT structured cabling systems within various Healthcare facilities and is a reference of common technology and design best practices.

General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; ICT Glossary; Regulatory; Infrastructure; General Design; Healthcare Systems; Healthcare Communications; and Integrated Systems.

This standard is for use in the design and implementation of the structured cabling systems used within Healthcare Institutions & Facilities and is a reference of common technology and design practices. It is intended primarily for, but not limited to: Hospitals (owners and operators), Nursing Homes, Rehabilitation Facilities, Clinics & Surgical Facilities, Authorities having jurisdiction (AHJ).

The Healthcare Standards & Codes presentation will focus on explaining “Standard & Codes” as they pertain to “Telecommunications Installation Professionals” such as cabling contractors, integrators and their installation personnel. Standards organizations involved in Information & Communications Technology (ICT) such as BICSI, the TIA, the IEEE, the ITU, and the NEC are explained.

PRICING COURSES & CERTIFICATIONS

TR-STD-HFC	*Healthcare Facilities*	**$50**

TR-STD-OSP Outside Plant

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation is for use in the design and implementation of Outside Plant infrastructure and is a reference of common technology and design best practices.

General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; Safety Considerations; Tools and Equipment; General Safety; Grounding and Bonding; Rights of Way; and Drawings and Specifications.

Explaining Outside Plant (OSP) "Standards; Codes & General Practices" for "Telecommunications Installation Professionals" is based upon applicable OSP National and International Standards & Codes and covers the installation of telecommunication and data cabling used within the outside plant (OSP) environment.

PRICING COURSES & CERTIFICATIONS

TR-STD-OSP	*Outside Plant*	**$25**

TR-STD-POE Power Over Ethernet

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation is for use in the design and implementation of the ICT remote control systems such as power over ethernet in structured cabling and industrial systems and is a reference of common technology and design best practices.

Remote control using Power over Ethernet (PoE) is the delivery of data and power over Category rated ethernet cable. PoE installation generally costs less and does not require a qualified electrician, saving building owners valuable time and labor costs.

General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; ICT Glossary; Cable Bundles; and best practices.

PRICING COURSES & CERTIFICATIONS

TR-STD-POE	*Power Over Ethernet*	**$25**

TR-STD-INT Introduction to Market Standards

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation series for use in the design, installation, and implementation of the structured cabling infrastructures and is a reference of common technology and design best practices.

It is difficult for “Telecommunications Installation Professionals” such as cabling contractors, integrators and technical and installation personnel to stay current with codes, standards and installation practices. Thefiberschool on-line training presentation series is focused on providing “Standards, Codes & Best Practices“ presentations which apply to various telecommunications infrastructures or projects. They overview and explain the various organizations involved in “ICT” (Information & Communications Technology) including BICSI, the TIA, the IEEE, the ITU, and the NEC as they pertain to those various market infrastructure projects.

Although telecommunication professionals make investments in training by obtaining important manufacturer and individual certifications, many soon realize that it is just the beginning. Often, although they may have valuable installation skills as a result of their training they may still lack important knowledge or understanding of the various market standards and codes that impact the quality of an installation project.

These on-line training presentations offer a convenient, cost-effective ($25 or $50) option to understand complicated market Standards, Codes, and best practices. Presentations remain active for repeated viewing up to 4 times or 1 month.

PRICING COURSES & CERTIFICATIONS

TR-STD-INT	*Introduction to Market Standards*	**$25**

TR-STD-GRD ICT Grounding and Bonding

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation is for use in the design and implementation of the ICT structured cabling systems used within commercial building facilities and is a reference of common technology and design best practices.

Explaining “Standard & Codes” for “Telecommunications Installation Professionals” based upon the ICT Bonding & Grounding Standards covers the installation of ICT Telecommunication Bonding and Grounding infrastructure.

General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; ICT Glossary; Regulatory and Safety; Components and Infrastructure; Planning Connections; Installation Practices; and Test and Inspection.

PRICING COURSES & CERTIFICATIONS

TR-STD-GRD	*ICT Grounding and Bonding*	**$25**

TR-STD-EDF Educational Facilities

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation is for use in the design and implementation of the structured cabling systems used within Educational ICT Facilities and is a reference of common technology and design best practices.

The Educational Facilities Standards & Codes presentation is primarily based upon the TIA 568 standard and applicable codes and best practices as they pertain specifically to educational facilities. General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; ICT Glossary; Infrastructure; Special Systems; Classroom; Admin Spaces; Functional Areas; Residencies; Physical Education; Campus and Building Services; and Special Areas.

Intended for Owners and Operators, Maintenance personnel, Contractors and Integrators, Installers, Technicians, Projector Managers and Authorities having jurisdiction (AHJ), this presentation also covers Standards organizations involved in Information & Communications Technology (ICT) such as BICSI, the TIA, the IEEE, the ITU, and the NEC.

PRICING COURSES & CERTIFICATIONS

TR-STD-EDF	*Educational Facilities*	**$50**

TR-STD-ESS Electronic Safety and Security

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation is for use in the design and implementation of the ICT Electronic Safety and Security Systems in structured cabling systems within commercial building facilities and is a reference of common technology and design best practices.

General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; ICT Glossary; Infrastructure; Intrusion Detection Systems; Video Surveillance Systems; Access Control Systems; Fire Alarm Systems; Integrated Systems; Risk Management; and Commissioning.

The ESS Standards & Codes Series will focus on explaining "Standard & Codes" as they pertain to "Telecommunications Installation Professionals" such as cabling contractors, integrators and their installation personnel. Standards organizations involved in Information & Communications Technology (ICT) such as BICSI, the TIA, the IEEE, the ITU, and the NEC are explained.

PRICING COURSES & CERTIFICATIONS

TR-STD-ESS	*Electronic Safety and Security*	**$50**

TR-STD-ICT ICT Facilities

LEVEL 0 — PREREQUISITE: NONE **ONLINE SELF-PACED COURSE** **XX HOURS** of online instruction

This TFS Standards & Codes presentation is for use in the design and implementation of the ICT structured cabling systems within commercial building facilities and is a reference of common technology and design best practices.

General Section Topics include: Introduction; Terms & Conditions; Applicable Codes and Standards; ICT Glossary; Infrastructure; Intrusion Detection Systems; Video Surveillance Systems; Access Control Systems; Fire Alarm Systems; Integrated Systems; Risk Management; and Commissioning.

The ICT Facilities Standards & Codes presentation is primarily based upon the TIA568 Commercial Buildings Standard and is intended for Owners and Operators, Maintenance personnel, Contractors and Integrators, Installers, Technicians, Projector Managers and Authorities having jurisdiction (AHJ).

Standards organizations involved in Information & Communications Technology (ICT) such as BICSI, the TIA, the IEEE, the ITU, and the NEC are also explained. TFS Standard & Codes for ICT Facilities standard is for use in the design and implementation of the structured cabling systems used within ICT Facilities and is a reference of common technology and design best practices.

PRICING COURSES & CERTIFICATIONS

TR-STD-ICT	*ICT Facilities*	**$50**

Custom Courses

The Fiber School will give you the exact training your company needs, we will train you and your employees exactly as needed to insure your field technicians will perform in a highly professional manner on the job. Most of our on-site course offerings are typically 4 days in length and feature agendas and hands-on exercises that can easily be adapted to your specific needs. In many cases these needs can be met within the standard 4 day course offerings but clients often require an additional day to address specific needs such as:

"Hands-On"

- You need your craftsmen prepared to begin working immediately with the practical hands-on experience gained in class on the equipment you use.
  - With your specific connector
  - With your specific fusion splicer
  - With your specific splice closure
  - With your specific OLTS or OTDR.

Mixed agendas

- You construct a fiber optic course that meets your needs then add items from our available certification courses.
  - Cover basic copper cabling common to Premise Wiring Systems
  - Cover basic Audio Visual systems
  - Cover basic CCTV, CATV, FTTx topics
  - Cover specific topics from our Outside Plant course
  - Cover additional OTDR techniques

Experience

Our skilled instructors and course developers have experience training all kinds of personnel including AT&T, Verizon, US Military, Government agencies, End Users and all categories of contractors enabling The Fiber School to easily customize any course.

Take Action

1. Select the course and certification desired
   - Select a topic or issue you desired to be added
2. Contact FiberOptic.com and request an on-site Custom quote
   - How many students?
   - Your location or a location near you?
   - Select a desired date that meets your needs and schedule
3. Review our proposal and book your training on-site with The Fiber School

PRICING COURSES & CERTIFICATIONS

TR-CUST	*The Fiber School Custom Training (Includes course materials)*

Custom course prices can vary depending on depth of material and number of days.

Call 877-529-9114 for an individualized quote.

On-Site Training

Take advantage of our most efficient and cost effective way to train you and your valuable employees. The Fiber School can bring any of its existing courses and certification exams to your location or to a facility near you.

It is always difficult to take valuable employees out of the field to attend training courses to obtain the certifications required to compete in today's fast paced competitive markets. If your employees are current certification holders, just keeping track of and scheduling their courses to get the required CEC's (Continuing Education Credits) is difficult. In addition ensuring your company field craftsmen are scheduled into the right courses to get and keep the individual certifications that your company requires and your clients expect is a challenge.

All this while getting the most out of your training budget.

Let The Fiber School help you meet your training goals with our On-Site training because it is:

Convenient and Flexible:

- You select the course, the start time, the end time, the date, the location
- We bring everything to you:
  - Equipment (or use your equipment)
  - Training manuals, lab exercises and a qualified instructor
  - Certification Exams.
- Your crafts people remain close to the field for unforeseen emergencies

Cost Effective:

- Reduce your company's travel expenses
- Increase your productivity and save time
- Save money - We'll help you stay within your Training budget

Take Action:

1. Select the course and certification
2. Contact The Fiber School and request an On-Site quote
   - How many students?
   - Your location or a location near you?
   - Select a desired date that meets your needs and schedule
3. Review our proposal and book your training On-Site with The Fiber School

PRICING COURSES & CERTIFICATIONS

On-Site training prices can vary depending on location, depth of material and number of days.

Call 877-529-9114 for an individualized quote.

The Fiber School

CERTIFIED TECHNICAL TRAINING

TheFiberSchool.com

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