

## ***RWDC Fiber Optic Installer (R-FOI)*** ***Mapped to: ETA® FOI Competency Requirements (installation, safety, connectors, splicing, testing)***

### **Course Summary**

A foundational fiber-installation training program preparing technicians to install, terminate, splice, and test fiber optic systems in premises and indoor/outdoor environments.

**Duration:** 40 hours (5 days) — blended theory + hands-on lab

### **Target Audience**

- ✓ New fiber technicians
- ✓ Copper cabling technicians transitioning to fiber
- ✓ ISP/FTTH installation teams

### **Prerequisites**

- Basic electrical understanding
- Ability to use hand tools

### **MODULE BREAKDOWN**

#### **Module 1 — History & Fundamentals of Fiber Optics**

- Evolution of fiber optics
- Light as EM energy, refraction, critical angle
- Decibels, dBm, optical power levels
- Loss mechanisms & Fresnel reflections

**Outcome:** Learners explain how light travels and how loss occurs.

#### **Module 2 — Fiber Construction & Characteristics**

- Core/cladding/coating
- Single-mode vs multimode
- Dispersion types
- Bend-insensitive fiber characteristics
- Standards: TIA-492, IEC 60793, ITU-T G.652/G.657

**Outcome:** Learners identify fiber types and choose appropriate cable for a job.

#### **Module 3 — Safety in Fiber Environments**

- Laser classifications
- Fiber shard hazards
- SDS/MSDS use
- Chemical & electrical hazards

**Outcome:** Demonstrate correct PPE and safe fiber disposal. Rehoboth Workforce Development Centre | Changing Lives. Transforming Teams. Impacting Results

#### **Module 4 — Fiber Optic Cables**

- Loose tube vs tight buffer
- Cable jacket materials
- Armored, breakout, messenger, hybrid cables
- Color coding (TIA-598)

**Outcome:** Learners read a cable cross-section and identify components.

**Module 5 — Splicing**

- Mechanical vs fusion splicing
- Alignment techniques
- Cleaving, protection, splice tray management

**Outcome:** Perform low-loss fusion splices to FOI performance requirements.

**Module 6 — Connectors**

- Ferrules, endface geometry
- APC, UPC, PC polishing
- Cleaning & inspection
- MPO/MTP connectors

**Outcome:** Terminate connectors and verify under microscope.

**Module 7 — Light Sources & Detectors**

**Outcome:** Learners distinguish LED vs laser sources and safely measure power levels.

**Module 8 — Installation Practices & Hardware**

- Patch panels, racks
- Conduit, tray, aerial, direct burial
- NEC 770 compliant routing

**Module 9 — Testing & Troubleshooting**

- Tools covered: VFL, OLTS, OTDR (intro)

**Outcome:** Perform Tier 1 certification tests.

**Practical Labs**

- Fiber preparation & cleaving
- Mechanical and fusion splicing
- Connector termination
- OTDR trace capture
- OLTS measurement
- Cable routing & protection

**Assessment**

- 50-item written exam
- Practical evaluation (splice, terminate, test)

**Certification**

Completing this course will prepare the participant for sitting the ETA FOI certification exam.

***RWDC Fiber Optic Technician – Outside Plant (R FOT OSP)  
Mapped to: ETA® FOT OSP Competencies (PON, ODN hardware,  
closures, OTDR advanced, outside plant safety).***

**Course Summary**

A professional OSP fibre program focusing on aerial, buried, and ODN level FTTH/PON deployments including closures, splice trays, slack management, OTDR fault analysis, and acceptance testing.

**Duration:** 60 hours (8 days)

**Target Audience**

- ✓ OSP fiber construction crews
- ✓ FTTH drop/feeder installers
- ✓ Network build & activation teams

**Prerequisites**

- ✓ Completion of R FOI or equivalent
- ✓ Outdoor work readiness

**MODULE BREAKDOWN**

**Module 1 — Principles of Light & SMF Transmission**

- Light sources/wavelengths used in SMF
- CWDM/DWDM windows
- SMF G.652D / G.657 / G.655 characteristics

**Module 2 — OSP Terminology & ODN Architecture**

- OLT/ONT roles
- FDU, FDH, FAT, MST
- Split ratios, PON budgets
- Outcome: Map an ODN using ITU FTTx standards.

**Module 3 — OSP Cable Types & Construction**

- Loose tube, armored, microduct cables
- Feeder, distribution, drop cables
- Dynamic vs static bend radius

**Module 4 — Splicing & Closures (Advanced)**

- Mechanical vs fusion in OSP
- GR 20 and GR 765 performance specs
- Closure configuration (butt, inline, dome)
- Mid span access techniques

**Module 5 — OSP Installation Methods**

- Aerial (lashing, strand mounting, messenger)
- Buried (conduit, trenches, depth standards)

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- Pulling grips, tension management
- NEC 770/NESC compliance

#### Module 6 — OSP Hardware

- FDH buildout
- FAT/MST deployment
- Slack loops & hub management

#### Module 7 — Fiber Link Engineering

- Power budgets
- “Not to exceed” loss budgets
- Attenuators & reflectance testing

#### Module 8 — OTDR & Field Testing (Advanced)

- Pulse width & deadzone management
- Bi directional testing
- Ghost events, reflectance, splitter signatures
- Acceptance testing

Outcome: Students interpret complex OSP traces.

#### Practical Labs

- Closure assembly and mid span access
- Outdoor cable placement (aerial & buried mockups)
- Advanced OTDR next gen PON testing
- Slack storage and FDH/FAT setup
- Power budget calculation exercises

#### Assessment

- Written exam
- Hands on OSP build project
- OTDR trace interpretation exam
- Certification
- Completing this course will prepare the participant for sitting the ETA FOT-OSP certification exam.



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## ***RWDC Fiber Optics Technician – Inside Plant (R-FOT-ISP) Mapped to: ETA® FOT-ISP Competency Requirements (1.0–16.0)***

**Course Code:** R-FOT-ISP

**Duration:** 48 Hours / 6 Day Bootcamp

**Delivery Format:** Instructor-Led + Hands-On Lab

**Prerequisite:** R-FOI or equivalent experience; Familiarity with fiber handling and basic test equipment

### **Course Summary**

A professional-level, inside-plant fiber-optics program that prepares technicians to install, terminate, splice, certify, document, and troubleshoot multimode and single-mode fiber systems in enterprise networks, campuses, central offices, and data centers. The course emphasizes high-density cabling, MPO/MTP architectures, data-center standards, Tier-1/Tier-2 testing, and restoration procedures.

### **Target Audience**

- Enterprise and data-center fibre technicians
- MPO/MTP cable plant installers
- ISP technicians supporting FTTx, POLAN, LAN/WAN, and central-office environments
- Intermediate fiber technicians looking to advance beyond FOI level

### **MODULE BREAKDOWN**

#### **Module 1 — Basic Principles of Light**

Topics: EM spectrum, IOR, Snell's Law, total internal reflection, Fresnel reflections.

#### **Module 2 — Fiber Optic Transmission**

Transmitter/receiver operation, decibels & dBm, gain/loss, reflectance, MM/SM wavelengths.

#### **Module 3 — Fiber Construction & Types**

OM1–OM5, OS1/OS2, mode field diameter, refractive profiles, attenuation & bandwidth specs.

#### **Module 4 — Fiber Characteristics**

Dispersion types, micro/macro bends, intrinsic attenuation, measurement per TIA-526-14-B & TIA-526-7.

#### **Module 5 — Safety**

Laser classifications, SDS, chemical hazards, PPE, work-area best practices.

#### **Module 6 — Fiber Optic Cabling & Codes**

Loose/tight buffer structures, UHD/rollable ribbon, hybrid/composite, NEC Article 770 cable types, TIA-598 color code, MPO color variants.

### **Module 7 — Splicing**

Mechanical & fusion splicing, cleaving, index matching gel, splice-on connectors, splice closures, OTDR IL procedures for reflective & non-reflective events.

### **Module 8 — Connectors & Polarity**

PC/UPC/APC, GR-326 geometry, MPO/MTP Type-A & Type-B, MPO-8/16 vs MPO-12/24 non-cross-mate rules.

### **Module 9 — Light Sources**

LED, VCSEL, FP/DFB lasers, spectral width, modal launch conditions, encircled flux.

### **Module 10 — Detectors & Receivers**

Photodiodes, SFP optics, dynamic range, sensitivity, wavelength response.

### **Module 11 — Passive Components & Multiplexers**

Splitters, attenuators, optical filters, SWDM, CWDM, DWDM.

### **Module 12 — Passive Optical LAN (POLAN) & FTTx Inside Plant**

POLAN architecture, maximum reach, SMF types, ISP components for PON.

### **Module 13 — Installation & Hardware**

TIA-568.3-D hardware, patch panels, OCEF requirements, TIA-606 administration, TOR/EOR.

### **Module 14 — System Design**

Power budgets (MM/SM), EMB/BWL reach calculations, MPO lane/wavelength planning, Uptime Tier I–IV.

### **Module 15 — Testing Equipment & Methods**

Tier-1 (OLTS) & Tier-2 (OTDR), TRCs/MQJs, launch/receive, IOR compensation, event analysis.

### **Module 16 — Troubleshooting & Restoration**

Fault isolation, OTDR diagnostics, acceptance documentation, span replacement and not-to-exceed budgets.

### **Hands-On Labs**

- Fiber preparation & inspection (IEC 61300-3-35)
- Mechanical & fusion splicing (G.652D/G.657)
- Connector installation (LC/SC, MPO)
- Patch-panel build & TIA-606 labeling
- OLTS Tier-1 certification (Methods A/B/C)
- OTDR Tier-2 testing, bi-directional averaging
- Data-center link build (TOR/EOR, MPO trunks)
- Restoration scenario

### **Assessment**

- **Written Exam:** 50 questions (dB/dBm math, safety, standards, testing)
- **Practical Evaluation:** connector pass/fail, splice loss targets, OLTS/OTDR execution, MPO polarity, restoration scenario

### **Certification**

Completing this course will prepare the participant for sitting the ETA FOT-ISP certification exam.

## ***RWDC Data Cabling Installer (R-DCI)*** ***Mapped to: ETA® DCI Competency Requirements (copper cabling, standards, LAN hardware, PoE, grounding, testing)***

### **Course Summary**

A structured cabling certification covering twisted-pair, coax, pathways, grounding, termination, PoE, testing and troubleshooting using industry standards (TIA-568, NEC, IEEE).

**Duration :** 40 hours (5 days)

### **Target Audience**

- Structured cabling installers
- ICT technicians
- Network installation teams
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### **Prerequisites**

None

### **MODULE BREAKDOWN**

#### **Module 1 — Safety & Basic Electricity**

- PPE and hazard management
- Ohm's law
- AC vs DC
- Noise sources & SNR
- Grounding (TIA-607-D)

#### **Module 2 — Introduction to Data Cabling**

- Telephone system basics
- Shielded vs unshielded cabling
- Plenum vs riser

#### **Module 3 — Data Communications Basics**

Topics include NEXT, ANEXT, PSNEXT, ACRF, etc.

#### **Module 4 — Cabling Specifications & Standards**

- TIA-568.0-E, 568.1-E, 568.2-D
- 10GBASE-T, PoE+/++
- ISO/IEC 11801

#### **Module 5 — Network Architecture**

OSI model (focus on data link/physical layers), Ethernet, topology design.

#### **Module 6 — Cable Construction & Performance**

- Cat3–Cat8 characteristics
- Mechanical performance
- Bend radius & tensile strength

#### **Module 7 — NEC & UL Requirements**

Topics: fire ratings, flame tests, UL 444, NEC chapters.

#### **Module 8 — Telecommunications Spaces & Infrastructure**

- TR, ER, TE



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- Backbone vs horizontal cabling

#### **Module 9 — Copper Installation Techniques**

- Pulling tension
- Dressing and routing
- Conduits & pathways
- Firestopping

#### **Module 10 — Connector Termination**

- RJ45 (8P8C) termination
- 66-block / 110-block
- Coax connectorization

#### **Module 11 — LAN Hardware**

NICs, media converters, switches, routers.

#### **Module 12 — Testing & Certification**

- Wiremap
- NEXT/PSNEXT
- Certification tools

#### **Module 13 — Troubleshooting & Documentation**

Creating TIA-606 compliant documentation.

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#### **Practical Labs**

- Cat6/6A termination
- Coax termination
- Patch panel assembly
- Grounding and bonding
- Certification testing with Fluke testers
- Firestop installation mockup

#### **Assessment**

- Written exam
- Termination practical
- Certification report generation

#### **Certification**

Completing this course will prepare the participant for sitting the ETA-DCI certification exam.