This workbook-based manufacturer neutral course expands upon the RF and spectrum analysis fundamentals learned in prior courses targeting systems where users have access to coax cabling for troubleshooting. These fundamentals are expanded to include systems with both fiber optics and coax cabling. Topics include an overview of fiber optic cables and small form-factor pluggables (SFPs), fiber inspections and cleaning, refraction, return loss, distance-to-fault (DTF), DTF fault resolution, insertion loss, baseband unit (BBU) emulation, common passive intermodulation (PIM) signatures, common fiber faults and their impact on RSSI, and spectrum analysis over fiber. The frequencies and radio manufacturer tests are tailored to each specific customer’s requirements. Course contains multiple labs and an optional field exercise.

**Target Audience**

<table>
<thead>
<tr>
<th>Wireless Carriers</th>
<th>RF Engineers</th>
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<tbody>
<tr>
<td>Public Safety</td>
<td>Entry Level Technicians</td>
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<tr>
<td>Military</td>
<td>Advanced Technicians</td>
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<tr>
<td>Contractors</td>
<td>Management (Technical)</td>
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<tr>
<td>Manufacturers</td>
<td>Non-Technical</td>
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**Recommended Prerequisites**

- Advanced Antenna Line & PIM RF Analysis (0300-00670-EN)
- Spectrum Analysis, PI, & Interference (0300-00671-EN)

**Objectives**

1. Differentiate between the various types of fiber optic cables and SFPs and their parameters.
2. Setup your test equipment to perform and analyze
   2.2. BBU emulation measurements.
   2.3. Spectrum analysis over fiber.
3. Explain how to
   3.1. Inspect and clean fiber optic cables.
   3.2. Differentiate between internal/external interference.

**Outline**

1. Fiber Fundamentals & Small Form-Factor Pluggables (SFPs)
2. Fiber Inspection and Cleaning
3. Optical Time Domain Reflectometer (OTDR) Trace Interpretation
   3.1. Refraction
   3.2. Return Loss
   3.3. Distance-to-Fault (DTF)
   3.4. Insertion Loss
4. BBU Emulation Measurements
5. RF Spectrum Analysis over Fiber