RDL Systems Technology Foundation (TEL-1)

TRN-TEL-VF

Course Specifics

Duration:	1 day
Class capacity:	10 students
Materials provided:	Student Handbook (e-Book)

Course Description

The TEL-1 non-certification course in an RF-101 course and consists of four modules focusing on RDL (RDL-3000, RDL-3100, RDL-5000) systems basic technology foundations, enabling trainees to acquire a working knowledge of broadband wireless systems, RF parameters, modulation and coding, ARQ, wireless system Tx and Rx building blocks, basic parameters of radio antennas, OFDM and MIMO systems in the context of the systems.

The course content is enriched with hands-on labs (with over 70% hands-on if done onsite). If done online, the hands-on part is limited to the demonstration and walk-through of the feature using a live ClearView server.

Courses are **conducted by AVIAT expert trainers** in a mentoring environment backed by their deep technology expertise and experience in

The course is **conducted at Aviat Training locations or can be arranged at customer sites**.

Target Audience

This course is intended Wireless deployment, installation and maintenance technicians, level-1 support teams, sales engineers, new hires without an engineering background.

Prerequisites

- Participants should have at least RCSA-RDL-3000 training and sound familiarity with the features. and functionalities of the RDL-3000 systems.
- Each student must have a laptop with administrative rights to install and run IP networking simulation software.

Objectives

Upon completing this course, the trainees will have gained the necessary expertise to understand the use and working of the following in the RDL systems excluding 4G systems:

- Broadband Wireless Access (BWA) networking and technologies
- The OSI and TCP/IP networking models
- Main parameters of information bearing and carrier signals
- Signal in time and frequency domains
- Single carrier and multi-carrier signal transmission
- Basic building blocks of a digital communications system
- TDD and FDD systems – introduction and differences
- Basics of digital modulation
- RF signal propagation parameters and properties.
- Antennas and their characterizing parameters such gain, beamwidth and polarization
- High level introduction to OFDM from RDL-3000 implementation point of view
- Definition of Diversity and MIMO systems
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Course Outline

Modules

Module-1: BWA Transmission and Wireless Overview
Module-2: Digital Transmission in Broadband Wireless
Module-3: RF Systems and Parameters
Module-4: OFDM and MIMO Systems Overview

Module-1: BWA Transmission and Wireless Overview

- BWA definitions and evolution – G1 to G4
- BWA solutions as Layer-2 wireless bridges
- BWA wireless link parameters
- TDD and FDD operation overview
- TDM (time division multiplexing) and TDMA time division multiple access)

Module-2: Digital Transmission in Broadband Wireless

- Basic block blocks of a digital communications systems and their functions
- Overview of signal frequency, power and phase
- Signal power measurement and signal quality metrics – SNR, BER
- Inter-symbol interference (ISI) and signal distortion at high data rates
- Digital modulation techniques definition – BPSK, QPSK and QAM (16/64/256)
- Forward error correction (FEC) and ARQ definition, function and use in BWA systems
- Signal baseband definition and its relationship to the system throughput

Module-3: RF Systems and Parameters

- RF signal time and frequency characteristics
- Signal loss as function of distance and signal frequency
- A simplified view of the wireless channel characteristics such fading and multipath
- Basic RF transmitter and receiver parameters
- IF and RF signals up-conversion and down-conversion
- Line of sight (LOS) and non-line of sight (NLOS) propagation definitions and conditions based on the Fresnel zone concept in RF
- Antenna overview
- RF Interference identification and mitigation
- Adjacent channel interference (ACI) and co-channel interference (CCI)
- Link budgeting and link path profiling

Module-4: OFDM and MIMO Systems Overview

- OFDM as a multi-carrier transmission technology
- OFDM and single-carrier transmission – a performance comparison at high date rates
- A simplified view of the OFDM signal characteristics in time and frequency
- Subcarrier spacing in OFDM
- The concept of guard interval in OFDM and how it can fix multipath issues
- Data rates and throughput of OFDM-based systems
- Basic multiple-antenna and MIMO systems definition
- MIMO ability to improve coverage and capacity of a wireless link

Lab Exercises and Basic Troubleshooting

- Basic hands-on exercises

EDUCATION SERVICES

Required Equipment for Training Sessions at Customer Sites

RADIO	Not Applicable.
OTHER EQUIPMENT	Not Applicable.
CLASSROOM SET UP	Sufficient in size to handle all participants, instructor, desks, chairs, classroom equipment. The room must have enough 110 AC (220) AC power and air conditioning to operate equipment, all student's client's PC's and the server or radio as required.

Classroom Equipment

Marker board, SVGA or Overhead projector and screen.

Desk and Chairs

Desks or workstations with enough room for each student to write have open books, client PC and / or, keyboard and monitor.

Internet Access

Internet access through the server or through client PC.

Pricing & Scheduling

Please contact your Aviat local sales team for a quote or email aviatcareeducate@aviatnet.com