iBwave CERTIFICATION COURSE SYLLABUS

LEVEL 2: PROPAGATION, COLLECTION AND OPTIMIZATION

LEARNING OBJECTIVES

At the end of this certification program, you will be able to:

✔ Plan for network scalability and expansion with reference to cables, connectors, and network components in Active DAS
✔ Run predictions using the Propagation Module
✔ Import and modify survey data using the Collection Module
✔ Calibrate and validate Fast Ray Tracing model parameters
✔ Import an outdoor prediction and use outdoor maps to visualize outdoor signals
✔ Optimize the network design by running predictions using the Optimization module
✔ Verify the project design to ensure accuracy and quality

PRE–COURSE FUNDAMENTALS

✔ Radio wave propagation basics
✔ Basic propagation models
✔ Antenna characteristics
✔ In-Building Propagation Models
✔ In-Building Propagation Measurement Guidelines

ACTIVE DAS/POWER SHARING

✔ Active DAS vs Passive DAS
✔ Active DAS Architecture
✔ Types of components
✔ Active DAS component examples
✔ Designing an active DAS fiber network
✔ Power sharing

PROPAGATION

✔ Propagation models
  • Fast Ray Tracing (FRT)
✔ Empirical (COST231)
✔ Variable Path Loss Exponent (VPLE)
  • Free Space Path Loss (FSPL)
✔ Process of running predictions
  • Prediction settings: configuring prediction and propagation properties
  • Defining prediction areas, environment types, and body loss zones
  • Propagation output maps: Signal Strength, RSCP, Handoff, Best Server, LTE RSRP, Service Count, and Field Strength
  • Output map reports

COLLECTION

✔ Data Collection
  • Importing survey data: from iBwave mobile or third party collection tools
  • Collecting data manually
  • Displaying and editing survey trace routes
  • Interpolating surveys
  • Survey data reports
✔ Calibration
  • Measurements required for model calibration
  • Identification of appropriate measurements to improve model accuracy
  • Propagation model calibration
✔ Validation
  • Calibrated model exponents
  • Calibrated versus uncalibrated projects
  • Coverage threshold planning

OPTIMIZATION

✔ Importing Outdoor Prediction
  • Defining building properties and coordinates
  • Importing outdoor predictions
  • Comparing outdoor and indoor predictions maps
✔ Optimization output maps
  • Setting up network optimization parameters
  • Integrating outdoor (neighboring) signals
  • Types of optimization output maps: Nature of Path, Interpolation Signal Strength, SNIR, MADR, Total Received Power, Handoff, Active Set, Eb/No Achievable Service Coverage, Dominance over Macro, Optimal Antenna Placement, LTE maps, and Uplink maps

ADVANCED DESIGN VALIDATION

✔ Validation checklist
  • Project property parameters
  • Systems
  • Debug message list errors and warnings
  • PIM calculations
  • Building materials
  • Floor plan scale and referent point
  • Floor plan order
  • Output map parameters
  • Comparison of predicted versus measured data
  • Report data

DESIGN FROM SCRATCH WORKSHOP

✔ Creating a new project: set up project properties; add floors, walls and surfaces according to specifications
✔ Designing a network: add systems and Active DAS components according to specifications
✔ Running predictions: create and run output maps according to specification

FINAL EXAM

(3 hours)