



iBwave CERTIFICATION COURSE SYLLABUS

LEVEL 2: PROPAGATION, COLLECTION AND OPTIMIZATION

Note: Course syllabus is subject to change

LEARNING OBJECTIVES

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

- ✓ Model a building incorporating walls and surfaces composed of various materials
- ✓ 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

(to be completed through the Learning Center)

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

BUILDING MODELING

- ✓ Importing walls
 - Importing walls using AutoCAD or image files
 - Locking size and position
 - Material legends and properties
- ✓ Drawing and editing walls
 - Drawing walls
 - Modifying and replacing walls
 - Changing wall properties
 - Simplifying walls
- ✓ Setting up horizontal surfaces
 - Creating horizontal surfaces
 - Creating holes in horizontal surfaces
 - Generating walls around or above horizontal surfaces
- ✓ Setting up inclined surfaces
 - Creating inclined surfaces
 - Generating walls around, above or at the end of inclined surfaces
 - Modeling cables along inclined surfaces
- ✓ Creating new material
- ✓ Viewing a project in 3D

PROPAGATION

- ✓ Propagation models
 - Fast Ray Tracing (FRT)
 - Empirical (COST231)
 - Variable Path Loss Exponent (VPLE)
 - Free Space Path Loss (FSPL)
- ✓ Antenna Contours
- ✓ 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 components according to specifications
- ✓ Running predictions: create and run output maps according to specification
- ✓ Cleaning up the design: use design plan organizer to clean up the design

FINAL EXAM

(2.5 hours)