



iBwave CERTIFICATION COURSE SYLLABUS

LEVEL 3: CAPACITY PLANNING, MIMO, STADIUM DESIGN, FIBER MODELING & Wi-Fi

Note: Course syllabus is subject to change

LEARNING OBJECTIVES

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

- ✓ Plan capacity in venues considering the major factors that influence capacity in mobile networks
- ✓ Identify factors influencing MIMO performance
- ✓ Explain the requirements for the design and deployment of a radio system in a stadium
- ✓ Plan for network scalability and expansion with reference to cables, connectors, and network components
- ✓ Design Wi-Fi networks for complex venues considering main technology issues and challenges

CAPACITY PLANNING

CAPACITY PLANNING THEORY

- ✓ Capacity background
- ✓ Grade of service / Quality of service
- ✓ User profiles
- ✓ Capacity limits
- ✓ Sample capacity calculations

CAPACITY PLANNING IN iBwave DESIGN ENTERPRISE

- ✓ Capacity planning process
- ✓ Capacity definition (template)
- ✓ Market share
- ✓ Usage profile
- ✓ Subscriber service
- ✓ Capacity requirements (project-specific)
- ✓ Requirements
- ✓ Sector limits
- ✓ Capacity zones
- ✓ Capacity map

MIMO

MIMO THEORY

- ✓ MIMO background
- ✓ MIMO operation modes: Diversity vs. Multiplexing
- ✓ Open loop vs. closed loop
- ✓ MIMO gains compared to SISO systems
- ✓ Factors influencing MIMO performance
- ✓ MIMO DAS deployments

MIMO IN iBwave DESIGN ENTERPRISE

- ✓ MIMO calculations in iBwave Design
- ✓ Modeling MIMO in iBwave Design
- ✓ Creating a MIMO source
- ✓ MIMO gain configuration
- ✓ Creating and running output maps for MIMO systems

STADIUM DESIGN

STADIUM MODELING AND DESIGN REQUIREMENTS

- ✓ Stadium modeling
 - Walls and surfaces
 - Custom material
 - Body loss zones
- ✓ Stadium design methodology
- ✓ Key performance indicators (KPIs)

STADIUM DESIGN ISSUES

- ✓ Designing stadiums
- ✓ Case study: Design for an international football stadium
- ✓ Design for distribution system
- ✓ Business case considerations

STADIUM DESIGN ADVANCED TOPICS

- ✓ Radio measurements
- ✓ Handover planning
- ✓ Multi-sector systems in stadiums
- ✓ Installation constraints
- ✓ Design considerations
- ✓ LTE Nth order best server maps and handoff matrices
- ✓ Frequency reuse

FIBER MODELING

FIBER MODELING THEORY

- ✓ Fiber optic cables
- ✓ Fiber optic connectors
- ✓ Types of fiber splicing
- ✓ Fiber distribution equipment

FIBER MODELING IN iBwave DESIGN ENTERPRISE

- ✓ Fiber distribution equipment
- ✓ Strand distribution
 - Fiber ring cut
 - Fiber strand management
- ✓ Connector alerts

Wi-Fi

Wi-Fi TECHNOLOGY ISSUES

- ✓ Wi-Fi basics
- ✓ Radio issues
- ✓ Network issues
- ✓ Dimensioning (radio and network)
- ✓ Managing the Wi-Fi radio environment

Wi-Fi DESIGN EXAMPLE

- ✓ The challenge
- ✓ Coverage planning
- ✓ Capacity planning
- ✓ Additional challenges
- ✓ Wi-Fi in iBwave Design
- ✓ Wi-Fi survey

FINAL DESIGN WORKSHOP

Review exercise in class to prepare for final exam (1 hour)

FINAL EXAM

Done online through the Learning Center in the week following the training (3 hours)