

Wireless Communication Systems

Module:1

- Introduction to Wireless Communication Systems
- Fundamentals of Radio Frequency (RF) and Microwave Engineering
- Wireless Communication Channel Characteristics
- Antenna Fundamentals and Design
- Wireless System Architecture

Module:2

- Wireless Communication Standards and Protocols (e.g. IEEE 802.11, 4G/5G, Bluetooth, ZigBee)
- Cellular Communication Systems (e.g. GSM, CDMA, LTE)
- Modulation Techniques for Wireless Communication (e.g. AM, FM, PM, QPSK, QAM)
- Coding Techniques for Wireless Communication (e.g. Convolutional, Turbo, LDPC)

Module:3

- Multiple Access Techniques for Wireless Communication (e.g. TDMA, FDMA, CDMA, OFDMA)
- Wireless Network Topologies (e.g. Point-to-Point, Point-to-Multipoint, Mesh, Ad Hoc)
- Wireless Sensor Networks (WSNs) and Internet of Things (IoT)
- Security and Privacy in Wireless Communication Systems
- Interference and Coexistence in Wireless Communication Systems

Module:4

- Radio Propagation Models and Path Loss
- Small Cell and HetNet Deployment Strategies
- Wireless Network Planning and Optimization
- Radio Resource Management (RRM) in Wireless Communication Systems
- Wireless Communication System Performance Analysis

Module:5

- Future Trends in Wireless Communication Systems (e.g. 6G, Terahertz Communications, Quantum Communications)
- Emerging Wireless Technologies (e.g. Visible Light Communications, Wireless Power Transfer)
- Case Studies and Examples of Wireless Communication Systems
- Hands-on Labs and Demonstrations