

WIRELESS COMMUNICATION – LESSON PLAN

Name: Gurmeet Kaur | Diploma in Electronics & Communication Engineering | 2 Theory Lectures + 2 Practical/Lab Periods per Week

Week	Theory Lecture 1	Theory Lecture 2	Practical/Lab 1	Practical/Lab 2
1	Unit I: Basics of Wireless Communication	Advantages of wireless communication; applications	Lab orientation; identify mobile/wireless communication equipment	Study features/specifications and working of a cellular mobile
2	Electromagnetic waves	Frequency spectrum used in wireless communication	Measure signal strength at different locations	Measurement of signal strength at various points from a transmitting antenna
3	Cellular Network Systems	Propagation considerations: range and fading	Study cellular network coverage and propagation effects	Demonstration of Base Transceiver Station (BTS) with nearby cellular tower
4	Unit II: Introduction to 2G	Cell area and basic cellular concept	Study GSM network elements and call flow	Observe call processing of GSM trainer kit
5	Cell Site Structure	Capacity of a cell	Study cell site components and functions	Visit/virtual study of Mobile Switching Centre (MSC)
6	Frequency Reuse	Co-channel and adjacent-channel interference	Analyze frequency reuse and interference using diagrams/simulation	Troubleshooting of a GSM mobile phone
7	Power control for reducing interference	Fundamentals of cell splitting and sectoring	Demonstrate power-control concept and sectoring	Study and demonstration of AT commands of GSM system using trainer kit
8	Unit III: Introduction to Multiple Access	FDMA; compare FDMA, TDMA and CDMA using simple examples	Revision/practical assessment: GSM trainer kit and AT commands	
9	TDMA	CDMA and WCDMA	Observe time-slot based access and compare with FDMA	Study of LTE mobile communication using trainer kit
10	Introduction to OFDMA	Comparison of multiple access techniques	Study OFDMA resource allocation concept	Study and demonstration of AT commands of LTE using trainer kit
11	Unit IV: GSM architecture	GSM system blocks and interfaces	Trace GSM architecture and communication path	GSM call processing / trainer-kit practice
12	GPRS, EDGE	Bluetooth and Wi-Fi; compare short-range wireless technologies	Practical study: Bluetooth and Wi-Fi features/operation	
13	Unit V: Introduction to 3G	Architecture and features of UMTS; compare 2G and 3G architecture/services	LTE/UMTS concept demonstration or simulation	
14	Features and architecture of LTE	LTE network elements and services	Study LTE architecture and data flow	LTE trainer-kit practical and AT-command practice
15	Introduction to 5G; concept of New Radio technology	5G features and applications; comparison with 4G	Study 5G NR concepts: massive MIMO, low latency, spectrum	5G concept/simulation activity; compare 4G and 5G
16	Comparison of 4G with 5G	Complete syllabus revision; important questions	Practical revision and troubleshooting	Final practical assessment / viva based on prescribed exercises