

Test: CLAT-1

Date: 21/02/25

Course Code & Title: 21ECE324T/ADVANCED MOBILE COMMUNICATION SYSTEMS

Duration: 12.30-2.20 pm

Year & Sem: III year / VI Sem

Max. Marks: 50

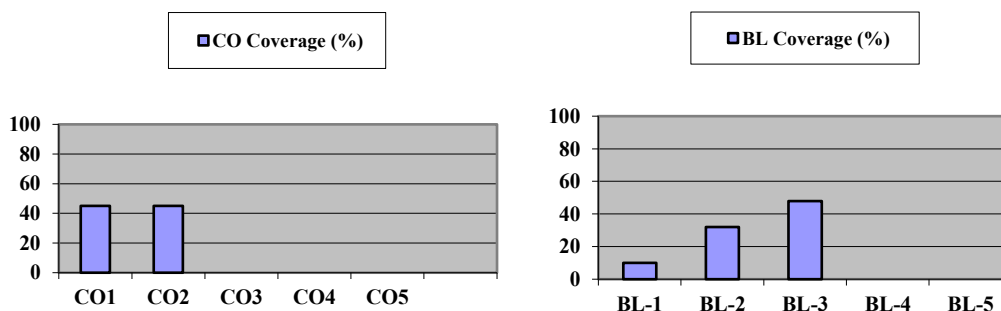
Course Articulation Matrix:

	21ECE324T ADVANCED MOBILE COMMUNICATION SYSTEMS	PROGRAM OUTCOME (PO)												PSO		
S.NO	COURSE OUTCOME	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Examine the development, challenges and requirements of mobile communications	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Interpret the methods that can be employed in improving the data rate of mobile communication systems.	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-
3	Connect the layers of communication systems	-	-	-	3	-	-	-	-	-	-	-	-	-	2	-
4	Analyze the techniques of Planning and deployment of communication network	-	-	-	2	-	-	-	-	3	-	-	-	-	-	-
5	Summarize the security, services and applications of Next generation communication techniques	-	2	-	-	-	-	-	-	-	-	-	3	-	-	-

Q. No	PART –A (10X1=10 Marks)	Marks	BL	CO	PO
1	The IEEE 802.11p standard is designed specifically for which type of communication? a) Satellite-to-ground comm. b) Vehicle-to-Vehicle (V2V) comm. c) Underwater communication d) Fiber-optic communication	1	1	1	1
2	Open Mobile Alliance device management is widely used for which of the following functionalities? a) Over-the-air software updates b) Managing cloud storage c) Sending text messages d) Streaming high-definition video	1	1	1	1
3	The ITU standard that defines 4G requirements is known as: a) IMT-2000 b) IMT-Advanced c) IMT-2020 d) LTE-Pro	1	1	1	1
4	Why is the fifth percentile user spectral efficiency an important metric in network performance? a) It ensures the fastest user experiences in the network b) It provides insights into the worst-case user experience in a loaded network c) It measures only the peak throughput for top users d) It determines the total energy consumption of the network	1	1	1	1
5	What is the purpose of trust boundaries in 5G networks? a) To limit the number of devices that can connect b) To divide the network into security zones for better management c) To improve radio signal strength d) To enhance data transmission speed	1	1	1	1
6.	How does higher-order modulation achieve increased data rates? a) By transmitting more bits per symbol b) By reducing the transmission power c) By using lower frequency bands d) By decreasing the channel bandwidth	1	1	2	1
7.	Which of the following is an example of cross-tier interference? a) Interference between two macro cells (MCs) b) Interference between a small cell (SC) and a macro cell (MC) c) Interference between two Wi-Fi access points d) Interference between a satellite and a ground station	1	1	2	1
8.	What happens when the frequency reuse factor is increased? a) Interference at the cell edges increases b) Interference at the cell edges decreases	1	1	2	1

	c) More users experience stronger signals d) Cell coverage expands significantly				
9.	Which of the following is a widely used multicarrier technology in modern wireless networks? a) CDMA b) OFDM c) TDMA d) FM	1	1	2	1
10.	What is the frequency range typically defined for millimeter wave (mmWave) communication? a) 1GHz – 10GHz b) 10GHz – 100GHz c) 30GHz – 100GHz d) 300GHz – 3THz	1	1	2	1
PART –B (2X8=16 Marks)					
11.	a) Outline the significance of the following standards: i) IETF, ii) ETSI, iii) IEEE and iv) ISO/IEC (OR) b) Define briefly on the following specifications on 5G: i) Peak Data rate, ii) Average Spectral Efficiency, iii) Latency and iv) Mobility	8	2	1	2
		8	2	1	2
12.	a) Describe the principles of Terahertz (THz) communication and its role in 6G networks. Also elaborate on key deployment challenges involved in it? (OR) b) i) Illustrate Shannon's Capacity Theorem and discuss its dependence on bandwidth utilization ratio and signal-to-noise ratio? ii) Analyze the significance of using unlicensed mmWave bands for 6G wireless communication?	8	2	2	3
		6+2	2	2	3
PART –C (2X12=24 Marks)					
13.	a) Elaborate in detail on the technical specifications of 3GPP for IMT 2020 (OR) b) i) Explain the various security requirements for 5G? ii) Brief the functionalities of Next Generation Mobile Network?	12	3	1	2
		8+4=12	3	1	2
14.	a) Evaluate the importance of Multi-Carrier Modulation (MCM) systems in modern wireless communication. Additionally, explain the principles of Filter Bank Multi-Carrier (FBMC) with its advantages and applications? (OR) b) i) Classify and explain the different types of interference in 5G wireless networks? ii) Analyze the impact of the cell-edge effect on network performance?	12	3	2	3
		(8+4=12)	3	2	3

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



Evaluation Sheet

Name of the Student:

Register No.:

Part- A (10 x 1= 10 Marks)					
Q. No	CO	PO	Maximum Marks	Marks Obtained	Total
1	CO1	1	1		
2	CO1	1	1		
3	CO1	1	1		
4	CO1	1	1		
5	CO1	1	1		
6	CO2	1	1		
7	CO2	1	1		
8	CO2	1	1		
9	CO2	1	1		
10	CO2	1	1		
Part- B (4 x 4= 16 Marks)					
11 a)	CO1	2	8		
11 b)	CO1	2	8		
12 a)	CO2	3	8		
12 b)	CO2	3	8		
Part- C (12 x 2= 24 Marks)					
13 a)	CO1	2	12		
13 b)	CO1	2	12		
14 a)	CO2	3	12		
14 b)	CO2	3	12		

Consolidated Marks:

CO	Maximum Marks	Marks Obtained
1	45	
2	45	
Total	90	

PO	Maximum Marks	Marks Obtained
1	10	
2	40	
3	40	
Total	90	

Course Teacher