SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF ECE
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2024-25 (EVEN)

BATCH 1
SET A

Test: CLAT-2 **Date:** 08/04/25

Course Code & Title: 21ECE324T/ADVANCED MOBILE COMMUNICATION SYSTEMS **Duration:** 12.30-2.20 pm

Year & Sem: III year / VI Sem **Max. Marks:** 50

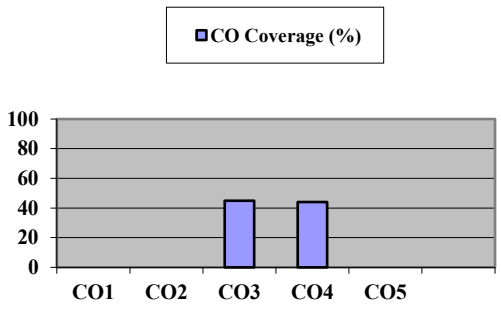
Course Articulation Matrix:

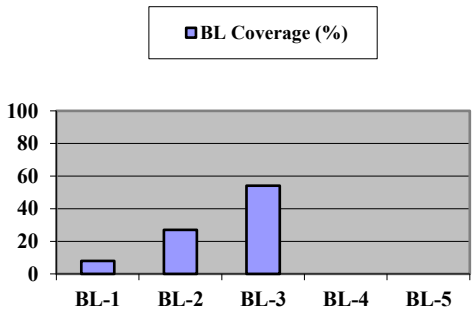
	21ECE324T ADVANCED MOBILE COMMUNICATION SYSTEMS	PROGRAM OUTCOME (PO)												PSO		
S.NO	COURSE OUTCOME	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Examine the development, challenges and requirements of mobile communications	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Interpret the methods that can be employed in improving 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 (11X1=11 Marks)	Marks	BL	CO	PO
1	What is the role of a cyclic prefix in OFDM? A) To reduce spectral efficiency. B) To eliminate inter-symbol interference. C) To increase transmission power. D) To reduce channel bandwidth	1	2	3	4
2	What is spatial multiplexing in MIMO? a) Transmitting multiple data streams simultaneously b) Transmitting data over multiple frequencies c) Transmitting data over multiple time slots d) Transmitting data with higher power	1	2	3	4
3	What does DFT-s-OFDM stand for? A) Digital Frequency Tuning-synchronized OFDM B) Dynamic Frequency Time-division OFDM C) Dual-Feed Transmitter OFDM D) Discrete Fourier Transform-spread-OFDM	1	1	3	4
4	How does hybrid beamforming improve MIMO efficiency? A) Eliminates the need for antenna arrays B) Relies solely on digital beamforming C) Uses analog phase shifters and digital signal processing D) Reduces QoS requirements	1	1	3	4
5	What is the purpose of channel estimation in 5G OFDM systems? a) To determine channel characteristics b) To increase transmission power c) To reduce latency d) To encrypt data	1	1	3	4
6.	What is the significance of the NG2 interface in 5G? A) User plane data transfer B) Spectrum sharing C) IoT device authentication D) Control plane signaling between RAN and 5G core	1	2	4	4
7.	Massive MIMO improves 5G networks by: a) Eliminating fiber optics b) Reducing SIM card size c) Beamforming and spatial multiplexing d) Slowing data rates	1	1	4	4
8.	Which European project focuses on converged fronthaul and backhaul networks for 5G? A) 5G-XHaul B) 5G-PPP C) NFV-SDN D) ITU-R	1	1	4	4
9.	A dense urban area deploying mmWave 5G would prioritize: a) 2G fallback b) Macro towers only c) Small cell densification d) SIM card swaps	1	1	4	4

10.	What is the purpose of network slicing in 5G? A) To reduce hardware costs B) To create virtual networks tailored for specific use cases C) To increase latency for critical applications D) To eliminate SDN and NFV requirements	**1**	**1**	**4**	**4**
11.	Device Under Test (DUT) in 5G radio planning measures: a) Signal strength and interference b) SIM card temperature c) User app preferences d) Data center humidity	**1**	**1**	**4**	**4**
	PART –B (3X8=24 Marks)				
12	Explain the various blocks of Orthogonal Frequency Division Multiplexing (OFDM) with its functionalities. Also list out its variants deployed in 5G?	**8**	**2**	**3**	**4**
	(OR)				
	Describe in detail the functionality of the gNB in 5G radio networks?	**8**	**2**	**3**	**4**
13	Describe the different types of beamforming techniques used in 5G systems and give note on their merits and demerits	**8**	**3**	**3**	**4**
	(OR)				
	Illustrate the need for channel estimation techniques, also list the various methods employed in equalizing a channel.	**8**	**3**	**3**	**4**
14	Elaborate the mechanisms involved in network slicing and explain how the resource allocation is performed transport network?	**8**	**2**	**4**	**4**
	(OR)				
	Explain the process of 5G network radio planning in frequency above 6GHz with example?	**8**	**2**	**4**	**4**
	PART –C (1X15=15 Marks)				
15	a) i) Explain the various types of standalone and non-standalone architecture in 5G core deployment scenarios?	**11**	**3**	**4**	**4**
	ii) Describe spectral efficiency loss give its significance	**4**	**3**	**3**	**4**
	(OR)				
	b) i) Describe the roles of the various interfaces deployed between gNB and the various core network in 5G architecture?	**11**	**3**	**4**	**4**
	ii) Distinguish between cyclic prefix and guard time	**4**	**3**	**3**	**4**

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





Evaluation Sheet

Name of the Student: **Register No.:**

Part- A (11 x 1= 11 Marks)					
Q. No	**CO**	**PO**	**Maximum Marks**	**Marks Obtained**	**Total**
1	**CO3**	4	**1**		
2	**CO3**	4	**1**		
3	**CO3**	4	**1**		
4	**CO3**	4	**1**		
5	**CO3**	4	**1**		
6	**CO4**	4	**1**		
7	**CO4**	4	**1**		
8	**CO4**	4	**1**		
9	**CO4**	4	**1**		
10	**CO4**	4	**1**		
11	**CO4**	4			
Part- B (3 x 8= 24 Marks)					
12	**CO3**	4	**8**		
13	**CO3**	4	**8**		
14	**CO4**	4	**8**		
Part- C (1 x 15= 15 Marks)					
15 a)	**CO4**	4	**11**		
	CO3	4	**4**		
15 b)	**CO4**	4	**11**		
	CO3	4	**4**		

Consolidated Marks:

CO	**Maximum Marks**	**Marks Obtained**
3	45	
4	44	
Total	**89**	

PO	**Maximum Marks**	**Marks Obtained**
4	89	
Total	**89**	

Course Teacher **Course Coordinator** **Academic Advisor** **Professor In-charge**