FR. Conceicao Rodrigues College of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Electronics Engineering

Lecture Plan

Subject: Mobile Communication (MC-EXC 8042)

Credits:-4

B.E. (ELECRONICS) (Semester VIII) (2018-19)

1. Syllabus

Module	Unit	Topics	Hrs.
No.	No.	Cellular Communication System	10
1	1.1	Introduction to Cellular Communications, Frequency reuse, Multiple Access Technologies	10
	1.2	Cellular Processes: Channel assignment, Call Setup, Handoff strategies, interferences and system capacity	
98.52	1.3	Traffic Theory: Trunking and grade of service, improving system capacity	
2		GSM	8
	2.1	GSM Network architecture, signaling protocol architecture, identifiers, channels, Frame structure, speech coding, authentication and security, call procedure, handoff procedure, services and features	
3		CDMA digital cellular standard (1S-95).	8
5216	3.1	Frequency and channel specifications of IS-95, forward and reverse CDMA channel, packet and frame formats, mobility and radio resource management	
4		3 G Mobile Communication System	10
50,000	4.1	2.5 G TDMA Evolution Path, GPRS, EDGE, 2.5G CDMA one cellular N/W, Need of 3G Cellular N/w, IMT 2000 Global Standard, UMTS Technology, W-CDMA Air interface, TD-SCDMA Technology, CDMA 2000 Cellular Technology	
5		4G Wireless Standards	8
	5.1	Need for 4G network, difference between 3G and 4G, LTE, WiMAX	
6		Emerging Technologies	8
	6.1	Mobile Adhoc Network, Mobile IP and Mobility Management, Mobile TCP, Wireless Sensor Networks, RFID Technology	
		Total	52

2. Course Outcomes:

At the end of the course student will be able to

EXC8042.1: Explain the fundamentals of Mobile communication.

EXC8042.2: Design a cellular system based on capacity and SNR.

EXC8042.3: Comprehend the techniques involved in GSM and CDMA systems.

EXC8042.4: Explain the 3G and 4G network standards and personal access wireless technologies.

3. Relationship of course outcomes with program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EXC8042.1	3													
EXC8042.2	3	3			2									
EXC8042.3	3				3									2
EXC8042.4	3									2				
Average	3	3			2					2				2

4. CO Assessment Tools:

Course	Assessment Method										
Outcome	Direct Method (80 %)										
	Unit	Tests	Laboratory Assignments		Quiz		Seminar	End Semester Exam	Course exit survey		
	1	2		1	2	3					
EXC 8042.1	20%	10%		10%			10%	50%	100%		
EXC 8042.2	30%		20%					50%	100%		
EXC 8042.3	10%	10%	10%		10%		10%	50%	100%		
EXC 8042.4		20%				10%	20%	50%	100%		

5. Curriculum Gap/Content beyond syllabus (if any):

- i) Students presented seminars on recent topics and technologies related to mobile communication.
- ii) They also made mobile applications for Android OS.

6. Lecture Plan:

CLAS	S			BE Electronics, Semester VIII							
Acade	mic Term			January – Apri	January – April 2019						
Subjec	et			Mobile Co	Mobile Communication (EXC 8042)						
Peri	ods (Hou	rs) per week		Lecture	4						
				Practical							
				Tutorial							
ì	Evaluatio	n System			Н	ours	Marks				
				Theory examination		3	80				
				Internal Assessment		2		0			
				Practical Examination							
				Oral Examination							
				Term work							
				Total		100					
	Time '	Table		Day		Ti	me				
			Tuesday	_	12.00pm-1.00pm						
			Friday		11.00am-12.00pm						
Cour	se Con	tent and L	esson pla	n							
Week	Lecture	Da	ate	Topic							
No. Planned A			Actual			Remarks	Mapped	Mapped			
			Moa	lule 3: CDMA digital cellular sta	ndard (IS	T-95)					
1	1	01-01-19		Introduction to CO plan Introduction to 1G systems							

1.		2	04-01-19	Revision of DSSS, PN-seq generator,			DO1
Section Comparison Compar		2	04-01-19		I	ELX405.3	PO1,
Channels, forward channels block diagram		2	04.01.10				
diagram		3	04-01-19			71 3/405 2	POI
2					1	ELX405.3	
S	2	1	09 01 10			71 3/405 2	DO1
6	2						
15-01-19				2			
Reverse channels (AC)	2						
Access channels (AC)	3				1	LLX405.3	
Political Properties Reverse traffic channels: modulation, variable power transmission ELX405.3 Political Properties		8	18-01-19		I	ELX405.3	POI
Variable power transmission	4	0	22.01.10				DO1
10 25-01-19 Reverse channel frames ELX405.3 POI	4	9	22-01-19		I	ELX405.3	POI
11 29-01-19 Mobility and Resource Management ELX405.3 PO1 12 01-02-19 NPTEL lecture on CDMA (IS-95) ELX405.3 PO1 13 08-02-19 2.5G TDMA evolution path, HSCSD UTI: 04, 05,06:02/19 ELX405.4 PO1, PO10 7 14 12-02-19 GPRS Assignment-1 ELX405.4 PO1, PO10 8 15 22-02-19 EDGE, 2.5G edmaone cellular network ELX405.4 PO1, PO10 9 16 26-02-19 Need of 3G cellular network, IMT2000 ELX405.4 PO1, PO10 17 01-03-19 UMTS technology, W-CDMA Air interface ELX405.4 PO1, PO10 18 05-03-19 UMTS technology, CDMA 2000 ELX405.4 PO1, PO10 10 18 05-03-19 Need for AG network, difference ELX405.4 PO1, PO10 11 20 12-03-19 WiMAX ELX405.4 PO1, PO10 12 21 19-03-19 Mobile Adhoc Networks ELX405.4 PO1, PO10 13 23 26-03-19 Mobile TCP ELX405.4 PO1, PO10 24 29-03-19 Wireless Sensor Networks ELX405.4 PO1, PO10 14 25 02-04-19 RFID Technology ELX405.4 PO1, PO10 15 WPTEL Lecture on GSM ELX405.4 PO1, PO10 15 UT2: 08-04-19 to 10-04-19		10	25 01 10			7. 37.405.2	DO1
12	-						
Module 4: 3G Mobile Communication System 2.5G TDMA evolution path, HSCSD UT1: 04, 05,06/02/19 ELX405.4 PO1, PO10)						
Columbia		12	01-02-19			LLX405.3	POI
Section Policy		12	00 02 10				DO1
Table Tabl	o	13	08-02-19	2.3G IDIVIA evolution path, HSCSD	UT1: 04, 05,06/02/19	ELX405.4	
Sesignment Selection Sel	7	1.4	12.02.10	CDDC		 	
Section	/	14	12-02-19	GPRS	Assignment-1 I	ELX405.4	
16	0	1.5	22.02.10	FDCF 25C 1 11.1 4 1			
16	8	15	22-02-19	EDGE, 2.3G cdmaone cellular network	I	ELX405.4	
Color Colo	0	1.6	26.02.10	N. 1 62G 11 1 4 1 D/T2000			
17	9	16	26-02-19		I	ELX405.4	
Interface		1.7	01.02.10	Global standard			
18		17	01-03-19	UM IS technology, W-CDMA Air	I	ELX405.4	
Cellular Technology BLX405.4 PO10	10	1.0	05.02.10				
19	10	18	05-03-19		I	ELX405.4	
19				Modulo 5 AC Windows Standards			POIU
between 3G and 4G, LTE				Module 3: 4G Wireless Sumaurus			
between 3G and 4G, LTE	Ī	19	08-03-19	Need for 4G network, difference		7. 37.405.4	PO1,
Mobile 6: Emerging Technologies ELX405.4 PO10				between 3G and 4G, LTE		LLX405.4	PO10
12 19-03-19 Mobile Adhoc Networks ELX405.4 PO1, PO10	11	20	12-03-19	WiMAX		TI 37.405.4	PO1,
12					1	ELX405.4	PO10
22 22-03-19 Mobile IP and Mobility Management ELX405.4 PO10				Module 6: Emerging Technologies			
22 22-03-19 Mobile IP and Mobility Management ELX405.4 PO10	12	21	19-03-19	Mobile Adhoc Networks			PO1
22 22-03-19 Mobile IP and Mobility Management ELX405.4 PO1, PO10	1,2	21	17-03-17	Wiodic Adioc Networks	I	ELX405.4	
13 23 26-03-19 Mobile TCP ELX405.4 PO10	1	22	22 03 10	Mobile IP and Mobility Management			
13 23 26-03-19 Mobile TCP ELX405.4 PO1, PO10 24 29-03-19 Wireless Sensor Networks ELX405.4 PO1, PO10 14 25 02-04-19 RFID Technology ELX405.4 PO1, PO10 26 05-04-19 NPTEL Lecture on GSM		22	22-03-19	Widdle if and Widdlitty Wallagement	I	ELX405.4	
24 29-03-19 Wireless Sensor Networks ELX405.4 PO10	12	23	26.03.10	Mobile TCP			
24 29-03-19 Wireless Sensor Networks ELX405.4 PO1 , PO10	13	23	20-03-19	Widdle 1C1	I	ELX405.4	
14 25 02-04-19 RFID Technology ELX405.4 PO10 26 05-04-19 NPTEL Lecture on GSM Technology UT2: 08-04-19 to 10-04-19	-	24	20.02.10	Wireless Sensor Networks			
14 25 02-04-19 RFID Technology ELX405.4 PO1, PO10 26 05-04-19 NPTEL Lecture on GSM Technology ELX405.3 PO1 15 UT2: 08-04-19 to 10-04-19		∠4	29-03-19	W Heless Schsol Inclwolks	I	ELX405.4	
26 05-04-19 NPTEL Lecture on GSM ELX405.3 PO1 Technology UT2: 08-04-19 to 10-04-19	1.4	25	02 04 10	PEID Technology			
26 05-04-19 NPTEL Lecture on GSM Technology UT2: 08-04-19 to 10-04-19	14	23	02-04-19	Ki iD reciniology	I	ELX405.4	
Technology UT2: 08-04-19 to 10-04-19		26	05.04.10	MPTEL Lecture on GSM			
15 UT2: 08-04-19 to 10-04-19		20	03-04-19		I	ELX405.3	POI
	15			reciniology	IIT2: 08-04 10 to 1	<u>0-04-10</u>	<u> </u>
Total 26					012. 00-04-19 10 1	U-U-1-17	
	Total	26					

Recommended Books:

- Wireless Communication: Principles and Practice, Theodore S Rappaport, PHI
- Mobile and Personal Communication System & Services, Raj Pandya, PHI
- Principles of Wireless Networks, Kaveh Pahlavan, Prashant Krishnamurthy, PHI
- Wireless Communication and Networking, Vijay Garg, Elsevier Inc
- Wireless Communication, Singhal, TMH
- Fundamentals of Wireless Communication, David Tse, Pramod Viswanath, Cambridge University Press
- Wireless Communication, Andreas Goldsmith, Cambridge University

Internal Assessment (IA):

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the test will be considered as final IA marks

End Semester Examination:

- 1. Question paper will comprise of 6 questions, each of 20 marks.
- 2. Total 4 questions need to be solved.
- 3. Question No.1 will be compulsory and based on entire syllabus wherein sub questions of 2 to 5 marks will be asked.
- 4. Remaining questions will be selected from all the modules