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 No.	Unit No.	Topics	Hrs.
1		**Cellular Communication System**	10
	1.1	Introduction to Cellular Communications, Frequency reuse, Multiple Access Technologies	
	1.2	**Cellular Processes:** Channel assignment, Call Setup, Handoff strategies, interferences and system capacity	
	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 (IS-95).**	8
	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
	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 Outcome	*Assessment Method*								
	Direct Method (80 %)								*Indirect Method (20%)*
	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:

CLASS	BE Electronics, Semester VIII		
Academic Term	January – April 2019		
Subject	**Mobile Communication (EXC 8042)**		
Periods (Hours) per week	***Lecture***	***4***	
	Practical		
	Tutorial		
Evaluation System		***Hours***	***Marks***
	Theory examination	3	80
	Internal Assessment	--	20
	Practical Examination	--	--
	Oral Examination	--	--
	Term work	--	--
	Total	--	100

Time Table	***Day***	***Time***
	Tuesday	12.00pm-1.00pm
	Friday	11.00am-12.00pm

Course Content and Lesson plan

Week	**Lecture No.**	**Date**		**Topic**			
		Planned	**Actual**		Remarks	**Mapped**	**Mapped**
Module 3: CDMA digital cellular standard (IS-95)							
1	1	01-01-19		Introduction to CO plan Introduction to 1G systems			

	2	04-01-19		Revision of DSSS, PN-seq generator, convolutional encoder, interleaving		ELX405.3	PO1, PO5
	3	04-01-19		Introduction to CDMA, CDMA channels, forward channels block diagram		ELX405.3	PO1
2	4	08-01-19		Pilot channel generation		ELX405.3	PO1
	5	11-01-19		Sync channel		ELX405.3	PO1
	6	11-01-19		Paging channel		ELX405.3	PO1
3	7	15-01-19		Forward Traffic channel		ELX405.3	PO1
	8	18-01-19		Reverse channels: Block diagram, Access channels (AC)		ELX405.3	PO1
4	9	22-01-19		Reverse traffic channels: modulation, variable power transmission		ELX405.3	PO1
	10	25-01-19		Reverse channel frames		ELX405.3	PO1
5	11	29-01-19		Mobility and Resource Management		ELX405.3	PO1
	12	01-02-19		NPTEL lecture on CDMA (IS-95)		ELX405.3	PO1
Module 4: 3G Mobile Communication System							
6	13	08-02-19		2.5G TDMA evolution path, HSCSD	UT1: 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 cdmaone cellular network		ELX405.4	PO1 , PO10
9	16	26-02-19		Need of 3G cellular network, IMT2000 Global standard		ELX405.4	PO1 , PO10
	17	01-03-19		UMTS technology, W-CDMA Air interface		ELX405.4	PO1 , PO10
10	18	05-03-19		TD-SCDMA technology, CDMA 2000 cellular Technology		ELX405.4	PO1 , PO10
	Module 5: 4G Wireless Standards						
	19	08-03-19		Need for 4G network, difference between 3G and 4G, LTE		ELX405.4	PO1 , PO10
11	20	12-03-19		WiMAX		ELX405.4	PO1 , PO10
Module 6: Emerging Technologies							
12	21	19-03-19		Mobile Adhoc Networks		ELX405.4	PO1 , PO10
	22	22-03-19		Mobile IP and Mobility Management		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
	26	05-04-19		NPTEL Lecture on GSM Technology		ELX405.3	PO1
15					UT2: 08-04-19 to 10-04-19		
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