FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

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

Department of Information Technology

B.E. (I.T.) (Semester VI) (2018-2019)

Lesson Plan

Subject: Wireless Network Credits:

Syllabus

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Oral & Practical	Tutorial	Total
ITC604	Wireless Network	04	--	--	04	--	--	04

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Oral & Practical	Total
		Internal assessment			End Sem. Exam			
		Test1	Test2	Avg. of two Tests				
ITC604	Wireless Network	20	20	20	80	--	--	100

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Modulation and Demodulation Techniques, PSTN	02	
I	Fundamentals Wireless Communication	Fundamentals of Wireless Communication, Advantages, limitations and application, wireless media, Infrared Modulation Techniques, DSSS and FHSS, Frequency Spectrum: Radio and Infrared; Wireless generations: 1G: Cellular,2G: Mobile Radio,3G: UMTS- Security related Encryption Algorithm,4G	07	CO1

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II	Evolution of Wireless Technologies	Multiple Access Technique: TDMA, FDMA, CSMA, CDMA Wireless Technologies: GSM, GPRS, EDGE,CDMA,LTE, UMTS	10	CO1 CO2
III	Types of Wireless Networks	Ad-hoc: MANET & VANET, Application, Advantage and limitations; Wireless Sensor Network: Application, advantages and limitations	09	CO1 CO3
IV	Emerging Wireless Technologies and standards	WLL , WLAN- 802.11 (Wi-Fi), WPAN- 802.15.1/3/4 (Bluetooth, Zigbee), WMAN-802.16a (Wi-max) , Wi-max and LTE /3GPP comparison, Mi-fi, Ly-fi,	10	CO1 CO2 CO4
V	Wireless Network Design Considerations	Wireless technology, Cisco Unified Wireless Network, Designing Wireless Networks with Lightweight Access Points and Wireless LAN Controllers	07	CO1 CO2 CO3 CO4 CO5
VI	Wireless Network Security	The need, attacks, security serviced, WEP, Mobile IP, VPN(PPTP, LLTP, IPSec), Network Layer Security, Transport Layer Security, Email Security: PGP, S/ MIME, Internet Firewalls for Trusted System	07	CO1 CO2 CO3 CO6

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Subject: Wireless Network Credits:

Text Books:

1. Cellular Communications: A Comprehensive and Pratical Guide, Nishith Tripathi, Jeffery H Reed, Wiley
2. Wireless Mobile Internet Security, 2nd Edition, Man, Young Rhee, Wiley- IEEE press
3. Designing for Cisco Internetwork Solutions (DESGN), 2nd Edition, CCDA, Diane Teare, cisco Press.

References:

1. Introduction to Digital mobile communication, 2nd Edition, Yoshihiko Akaiwa
2. "Wireless Communications and networks", William Stallings, Pearson / Prentice Hall
3. Wireless communication and networking, Vijay Garg

Assessment:

Internal Assessment for 20 marks:
Consisting of **Two Compulsory Class Tests**
Approximately 40% to 50% of syllabus content must be covered in First test and remaining 40% to 50% of syllabus contents must be covered in second test.

End Semester Examination: Some guidelines for setting the question papers are as:

- Weightage of each module in end semester examination is expected to be/will be proportional to number of respective lecture hours mentioned in the syllabus.
- Question paper will comprise of total **six questions**, **each carrying 20 marks.**
- **Q.1** will be **compulsory** and should **cover maximum contents of the syllabus**.
- **Remaining question will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any other module. (Randomly selected from all the modules.)
- Total **four questions** need to be solved.

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Subject: Wireless Network Credits:

CO Statements

CO1	Explain the basic concepts of wireless network and wireless generations.
CO2	Demonstrate the different wireless technologies such as CDMA, GSM, GPRS, etc.
CO3	Appraise the importance of Ad-hoc networks such as MANET and VANET and Wireless sensor networks.
CO4	Describe and judge the emerging wireless technologies standards such as WLL, WLAN, WPAN, WMAN.
CO5	Explain the design considerations for deploying the wireless network infrastructure.
CO6	Differentiate and support the security measures, standards, services and layer wise security considerations.

CO-PO and CO-PSO Mapping

Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	1	2					2					2	2	3
CO2	1	2	3			2	2					2	3	1
CO3	1	2	3				2		2	2		2	2	1
CO4	1	2	3				2			2		2	2	2
CO5	1	2					2			2		2	2	2
CO6	1	2	3				2		2	3		2	1	3

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Subject: Wireless Network Credits:

CO Assessment tools with target

	Direct Methods								**Indirect Methods**
	Test1	**Assig1**	**Lab Work**	**Test2**	**Assig2**	**University Theory Result**	**University Oral Result**	**MCQ**	Course Exit Survey
CO1	**25%**		**40%**	**-**	**-**	**10%**	**25%**	**-**	**100%**
CO2	**50%**		**15%**	**-**	**-**	**25%**	**10%**	**-**	**100%**
CO3	**25%**		**45%**	**-**		**10%**	**20%**	**-**	**100%**
CO4	**-**			**50%**		**30%**	**20%**	**-**	**100%**
CO5	**-**		**40%**	**25%**		**10%**	**15%**	**-**	**100%**
CO6	**-**		**50%**	**25%**		**15%**	**10%**	**-**	**100%**

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Lesson Plan

Subject: Wireless Network Credits:

Curriculum Gap/Content beyond syllabus (if any).

Conducted Experiments

No.	Name
1	Study different WSN Open Source Simulators like ContikiCooja, Cupcarbon.
2	Installation of ContikiCooja.
3	Run Basic programs of cooja (Hello_world).
4	Simulate Broadcasting, RPL and LED on cooja.
5	Installation of cupcarbon and Run basic Hello_World Program using cupcarbon.
6	Write a program for blinking LED using cupcarbon and run it on Arudino.
7	Write a program for communication between two or more sensors using cupcarbon and run it on Arudino.
8	Write a program to broadcast a data using Cupcarbon.
9	Simulate a environment with the help of mobility sensor and marker in Cupcarbon to detect the intruder in system.
10	Write a program to implement DLPCN algorithm in Cupcarbon.

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Lecture Plan

No of classes Planned:	44	**No of Classes taken:**	44 + 4(Remedial)	
Sr. No.	**Topic Planned**	**Planned Date**	**Actual Date**	**Delivery Mechanisms**
1.	Fundamentals of Wireless Communication, Advantages, Limitations and applications	01/01/2019	01/01/2019	Board
2.	Wireless media, Infrared, Modulation Techniques	02/01/2019	02/01/2019	Board
3.	DSSS and FHSS	03/01/2019	03/01/2019	Board
4.	Frequency Spectrum, Wireless Generations: 1G, 2G, 3G, 4G	04/01/2019	03/01/2019	Board
5.	UMTS Security Related Encryption Algorithm	07/01/2019	07/01/2019	Board
6.	Multiple Access Techniques: TDMA, FDMA	08/01/2019	08/01/2019	Board +PPT
7.	Multiple Access Techniques: SDMA, CDMA	09/01/2019	09/01/2019	Board +PPT
8.	CSMA	10/01/2019	10/01/2019	Board +PPT

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Subject: Wireless Network Credits:

9.	Cellular Concept, Cell Splitting, Cell Sectorization	11/01/2019	10/01/2019	Board
10.	Frequency Reuse Concept, Handoff Strategies	14/01/2019	10/01/2019	Board
11.	Adjacent Channel and Co-Channel Interference	15/01/2019	11/01/2019	Board
12.	Numericals on Cellular Concept	16/01/2019	14/01/2019	Board
13.	Numericals on Frequency Reuse	18/01/2019	15/01/2019	Board
14.	Numericals on S/I Ratio	21/01/2019	16/01/2019	Board
15.	GSM Architecture, GSM services	23/01/2019	17/01/2019	Board +PPT
16.	GSM Channel Types and GSM Burst Structure	24/01/2019	18/01/2019	Board +PPT
17.	GPRS, EDGE	25/01/2019	21/01/2019	Board +PPT
18.	CDMA Architecture, CDMA Channels	28/01/2019	23/01/2019	Board +PPT
19.	LTE, UMTS	30/01/2019	24/01/2019	Board +PPT
20.	MANET, Applications, Advantages and Limitations	01/02/2019	25/01/2019	Board +PPT
21.	VANET, Applications, Advantages and Limitations	07/02/2019	30/01/2019	Board +PPT
22.	WSN, Applications, Advantages and Limitations	08/02/2019	01/02/2019	Board +PPT
23.	WSN Protocols	11/02/2019	07/02/2019	Board + PPT

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24.	WLL Architecture, LMDS and MMDS	18/02/2019	08/02/2019	Board + PPT
25.	WLAN 802.11 (Wi-Fi): PHY Layer	20/02/2019	11/02/2019	Board +PPT
26.	WLAN 802.11 (Wi-Fi): MAC Layer	21/02/2019	18/02/2019	Board +PPT
27.	WPAN-802.15.1 (Bluetooth architecture and Protocol Stack)	22/02/2019	20/02/2019	Board +PPT
28.	Bluetooth Attacks	25/02/2019	21/02/2019	Board +PPT
29.	WPAN-802.15.4 (Zigbee Architecture)	27/02/2019	22/02/2019	Board +PPT
30.	WMAN 802.16a (Wi-max)	28/02/2019	25/02/2019	Board +PPT
31.	Wi-max and LTE/3GPP Comparison	01/03/2019	26/02/2019	Board +PPT
32.	Mi-fi, Ly-fi	06/03/2019	07/03/2019	Board +PPT
33.	Wireless Network Design Considerations	07/03/2019	08/03/2019	Board +PPT
34.	Cisco Unified Wireless Network	08/03/2019	11/03/2019	Board +PPT
35.	Designing wireless networks with Lightweight Access Points	11/03/2019	13/03/2019	Board + PPT
36.	Designing wireless networks with Wireless LAN Controllers	13/03/2019	14/03/2019	Board +PPT
37.	The need of Wireless Network Security, Attacks	14/03/2019	19/03/2019	Board +PPT
38.	Security Services	18/03/2019	20/03/2019	Board +PPT

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39.	WEP, Mobile IP	20/03/2019	22/03/2019	Board +PPT
40.	VPN (PPTP, LLTP, IPSec)	22/03/2019	22/03/2019	Board +PPT
41.	Network Layer Security	25/03/2019	25/03/2019	Board +PPT
42.	Transport Layer Security	27/03/2019	27/03/2019	Board +PPT
43.	Email Security: PGP,S/MIME	28/03/2019	28/03/2019	Board +PPT
44.	Internet Firewalls for Trusted System	29/03/2019	29/03/2019	Board +PPT
45.	Remedial	01/04/2019	01/04/2019	
46.	Remedial	03/04/2019	03/04/2019	
47.	Remedial	04/04/2019	04/04/2019	
48.	Remedial	05/04/2019	05/04/2019	

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Lesson Plan

Subject: Wireless Network Credits:

Lab Plan

No.	Name	Batch A	Batch B
1	Study different WSN Open Source Simulators like ContikiCooja, Cupcarbon.	16/01/19	17/01/19
2	Installation of ContikiCooja.	23/01/19	24/01/19
3	Run Basic programs of cooja (Hello_world).	23/01/19	24/01/19
4	Simulate Broadcasting, RPL and LED on cooja.	30/01/19	21/02/19
5	Installation of cupcarbon and Run basic Hello_World Program using cupcarbon.	20/02/19	21/02/19
6	Write a program for blinking LED using cupcarbon and run it on Arudino.	27/02/19	07/03/19
7	Write a program for communication between two or more sensors using cupcarbon and run it on Arudino.	13/03/19	07/03/19
8	Write a program to broadcast a data using Cupcarbon.	13/03/19	14/0319
9	Simulate a environment with the help of mobility sensor and marker in Cupcarbon to detect the intruder in system.	20/03/19	14/03/19
10	Write a program to implement DLPCN algorithm in Cupcarbon.	27/03/19	28/03/19