Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
ECCDL OC8013	Wireless Networks	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Exam Duration (Hrs.)	Term Work	Practical and Oral	Total
		Internal Assessment			End Sem. Exam.				
		Test1	Test2	Avg.					
ECCDL OC8013	Wireless Networks	20	20	20	80	03	--	--	100

Course Pre-requisite:

ECC602 - Computer Communication and Networks
ECC702 - Mobile Communication System

Course Objectives:

1. To analyze the fundamental architecture, design issues and standards of wireless networks.
2. To compare Personal Area Network (PAN) technologies such as ZigBee, Bluetooth, UWB, NFC and 6LoWPAN.
3. To classify different LAN topologies and technologies and ad hoc networks.
4. To classify network protocols, ad hoc vehicle networks and Wireless MANs.
5. To understand planning and design of GSM and CDMA system in Wireless WANs.
6. To apply Wireless sensor networks concepts to develop an IoT applications.

Course Outcomes:

After successful completion of the course student will be able to:

1. Explain fundamental architecture, design issues and standards of wireless networks.
2. Compare different types of Personal Area Network (PAN) technologies such as ZigBee, Bluetooth, UWB, NFC and 6LoWPAN.
3. Analyze different LAN topologies and technologies and ad hoc networks.
4. Compare various types of network protocols, ad hoc vehicle networks and Wireless MANs.
5. Evaluate the planning and design of performance of GSM and CDMA system in Wireless WANs.
6. Understand the basic network architecture of Wireless sensor networks concepts to develop an IoT applications.

Module No.	Unit No.	Topics	Hrs.
1.0		**Overview of wireless networks**	**04**
	1.1	**Wireless Networks:** Architecture, Classifications, Switching technology, Communication Problems, Reference Models. Networking issues and Networking Standard.	02
	1.2	**Wireless Body Area Networks:** Properties, Network Architecture, Network components and Applications	02
2.0		**Wireless Personal Area Networks**	**10**
	2.1	**WPAN:** Bluetooth (802.15.1): Radio Specifications, Protocol Stack, Link Types, Security, Topologies, Applications.	02
	2.2	**ZigBee (802.15.4):** Radio Specifications, Components, Topologies, Protocol Stack, Applications.	02
	2.3	**RFID:** Radio Specifications, Architecture, Types and applications.	02
	2.4	**Near Field Communication & UWB (802.15.3 a):** Introduction and working.	02
	2.5	**6LoWPAN:** Features, Architecture, protocol stack and applications	02
3.0		**Wireless Local Area Network & Wireless Adhoc Networks**	**06**
	3.1	**Wireless Local Area Network:** Equipment, Topologies, Technologies, Applications, Main features of IEEE802.11a,b, i and n, Protocol Architecture of WLAN	03
	3.2	**Wireless Adhoc Networks**: Features, advantages & Applications **Mobile Adhoc Networks:** Network Architecture, MAC Protocol.	03
4.0		**Wireless Metropolitan & Vehicular Adhoc Networks**	**05**
	4.1	**WMAN(IEEE802.16):**Introduction, WMAN Network Architecture, Network Protocols, Broadband Wireless Networks, Applications	03
	4.2	**Vehicular Adhoc Networks (VANETs):** Characteristics, Protocols & Applications	02
5.0		**Wireless Wide Area Networks**	**06**
	5.1	Planning and design of Wireless Networks, Radio design for a cellular Network	04
	5.2	Receiver sensitivity, Link budget for GSM and CDMA Systems, HSDPA	02
6.0		**Advanced Technologies of Wireless Networks**	**08**
	6.1	**Wireless Sensor Networks:** Network Architecture, Design Considerations, Network Protocol Stack, and Applications	04

	6.2	**Wireless Mesh Network:** Network architecture, Protocols, technologies & Applications	02
	6.3	**Internet of Things:** IoT Conceptual Frame work, Architecture, Technology & Examples. M2M Communication	02
		Total	**39**

Text Books & References:

1. Vijay K. Garg, "Wireless Communication and Networking", Morgan -Kaufmann Series in Networking—Elsevier
2. Kazem Sohraby, Daniel Minoli, and Taieb Znati, "Wireless Sensor Networks: Technology, Protocols, and Applications", Wiley Student Edition
3. Dr SunilkumarS. Manvi, Mahabaleshwar S. Kakkasageri, "Wireless and Mobile Networks Concepts and Protocol"Wiley India Pvt Ltd
4. Raj Kamal, "Internet of Things Architecture & Design Principles" Mcgraw Hill

Internal Assessment (20-Marks):

Internal Assessment (IA) consists of two class tests of 20 marks each. IA-1 is to be conducted on approximately 40% of the syllabus completed and IA-2 will be based on remaining contents (approximately 40% syllabus but excluding contents covered in IA-I). Duration of each test shall be one hour. Average of the two tests will be considered as IA marks.

End Semester Examination (80-Marks):

Weightage to each of the modules in end-semester examination will be proportional to number of respective lecture hours mentioned in the curriculum.

1. Question paper will comprise of **total 06** questions, each carrying **20 marks**.
2. **Question No: 01** will be **compulsory** and based on entire syllabus wherein 4 to 5 sub-questions will be asked.
3. Remaining questions will be mixed in nature and randomly selected from all the modules.
4. Weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.
5. **Total 04 questions** need to be solved.