

Branch Name:	Computer Engineering (Software Engineering)
Program Code:	ET203
Course Title:	Advanced Wireless Network and Mobile Computing
Course Code:	2ET2030204T
Pre-requisite Course:	Basic knowledge of Fundamental architectures of mobile and wireless networks, Mobile Ad Hoc networks and wireless sensor networks.

Course Objectives:

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

- To gain knowledge of recent advances in mobile networking and sensing, with an emphasis on practical design aspects of mobile systems.
- On successful completion of the course, the student will be having the basic knowledge of TCP/IP protocol suite and will understand the working of internet.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Course Contents:

Unit No	Topics	Total Hours	Weightage(%)
1	Wireless Networking: Introduction to wireless network, types and benefits of Wireless and Mobile Networks, Challenges of Wireless Networks, wireless network Architecture, Radio Propagation Mechanisms, Signals, Antennas; Characteristics of Wireless Channels; Modulation Techniques and Multiple Access Techniques for Wireless Systems.	6	15
2	Wireless Networks: Wireless PAN (Bluetooth), Wireless LAN (Wi-Fi), Wireless MAN (WiMAX) Technology, IEEE 802.11 Wireless LAN Standard, Network Architecture - Packet Data Protocol (PDP), Mobile radio propagation	6	15
3	Mobile Computing: Introduction of mobile computing, GSM Architecture, SMS, GPRS and Packet Data Network, EDGE, 3G, 4G,UMTS, Introduction to candidate proposals in 5G Wireless Internet: Address Mobility; Mobile IP – Dynamic Host Configuration Protocol and TCP/IP for Wireless Domains; WAP. Traditional TCP-Congestion Control.	7	20
4	Ad Hoc Mobile Wireless Networks: Introduction, advantages of ad-hoc/sensor network, driving applications, , issues in adhoc wireless networks, Ad Hoc Routing protocols, Routing in MANETs, Principles and protocols, MAC protocols in Ad-hoc Wireless networks (MACAW), Bluetooth	7	15
5	Multiple Access Techniques: Frequency Division Multiple access, TDMA, CDMA, OFDM, SDMA, , OFDM, Aloha, Slotted Aloha, CSMA	6	15
6	Wireless Sensor Networks(WSN): Introduction, Characteristics of WSN, Challenges and types for Wireless Sensor Networks, , issues in design of sensor network ,Routing in sensor Networks, sensor network architecture	7	20

Text Books:

1. Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002..
2. H. Karl and A. Willig, “Protocols and Architectures for Wireless Sensor Networks”, John Wiley & Sons, India, 2012.
3. Ad Hoc Mobile Wireless Networks: Principles, Protocols, and Applications Subir Kumar Sarkar, T.G. Basavaraju, C. Puttamadappa

Reference Books:

- ☐ Wireless Communications: Principles and Practice, 2nd Edition, By Theodore S. Rappaport.
- ☐ Wireless Communication, By Molisch-Wiley India
- ☐ Kaveh Pahlavan, PrasanthKrishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
- ☐ Wireless Communications & Networks, Second Edition,William Stallings by Pearson
- ☐ Jonathan Rodriguez, “Fundamentals of 5G Mobile Networks”. 1st Edition

Course Learning Outcomes (CLO):

Course Outcomes	Description	Bloom’s Taxonomy Level
COL1	Understand the concepts of wireless communications and wireless networking	Understanding (2) Applying (3)
COL2	Overview of Wireless Network Topologies (Infrastructure/Infrastructure-less, Stationary/Mobile), their layered architectures, current and emerging technologies.	Applying (3)
COL3	Solve fundamental problems in wireless networks, to Understand cellular evolution from 1G to 5G and associated mobility management.	Applying (3)
COL4	Distinguish various multiple-access techniques for mobile communications e.g. FDMA, TDMA, CDMA,	Applying (3)
COL5	Evaluate Ad-hoc networks and wireless sensor networks. Understand about the wireless sensor network architecture and its concept.	Applying (3)

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	M		M											
CLO2	H	M			M							L				
CLO3	H	M	M		M											
CLO4	M	M	M		M							L				
CLO5	M	M										L				

H: High, M: Medium, L: Low