Course Code	18CSE458T	Course Name	WIRELESS AND MOBILE COMMUNICATION	Course Category	E	Professional Elective	L	T	P	C
							3	0	0	3

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	
Course Offering Department	Computer Science and Engineering	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	Analyze the fundamental of transmission and cellular systems			
CLR-2 :	Apply skills in real time engineering problems and can have capability to evaluate the transmission errors			
CLR-3 :	Comprehend the concept of mobile network, transport layer and wireless technologies			
CLR-4 :	Differentiate the various types of cellular standard by their unique services.			
CLR-5 :	Grasp GSM. GPRS, Handover and Localization techniques			
CLR-6 :	Apply skills in various Routing protocols			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	Apply Wireless Technology concepts to Engineering problems related to communication	3	80	70
CLO-2 :	Improve their knowledge on Digital and analog Modulation techniques.	3	85	75
CLO-3 :	Equip themselves familiar with principle of Mobile Communication	3	75	70
CLO-4 :	Familiarize with Digital Cellular Standards	3	85	80
CLO-5 :	Acquaint with routing protocols	3	85	75
CLO-6 :	Expose to the emerging wireless technologies	3	80	70

		Program Learning Outcomes (PLO)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
CLO-1 :	Apply Wireless Technology concepts to Engineering problems related to communication	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H
CLO-2 :	Improve their knowledge on Digital and analog Modulation techniques.	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H
CLO-3 :	Equip themselves familiar with principle of Mobile Communication	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H
CLO-4 :	Familiarize with Digital Cellular Standards	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H
CLO-5 :	Acquaint with routing protocols	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H
CLO-6 :	Expose to the emerging wireless technologies	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H

Duration (hour)		9	9	9	9	9
S-1	SLO-1	Introduction to wireless communication	Cellular Concept	Introduction to GSM	Mobile IP	IEEE 802.11
	SLO-2	Elements of wireless communication system	Cell area	Frequency Bands and Channels	IP packet delivery	System Architecture
S-2	SLO-1	Frequencies for radio communication	Signal strength	Frames in GSM	Tunneling – Reverse Tunneling	Protocol Architecture
	SLO-2	Signals, Noise – Types of Noise	Cell parameter	Planes and layers of GSM	IPv6	MAC Layer and Management
S-3	SLO-1	Introduction to modulation and demodulation	Capacity of Cell	Protocols	DHCP	802.11a, 802.11b
	SLO-2	Signals in the modulation	Co channel interference	Localization and calling	Tradition TCP	HIPERLAN
S-4	SLO-1	Introduction to Analog modulation schemes	Frequency reuse	Handoff – Short messaging system	Congestion control	Bluetooth Architecture
	SLO-2	Amplitude Modulation Frequency modulation	Cell splitting Cell sectoring	GPRS EDGE	Classical TCP Snooping ,	IEEE 802.15 IEEE 802.15.4
S-5	SLO-1	Phase Modulation Introduction to Analog modulation schemes	Multiple Radio access protocols Frequencydivision Multiple Access	3G CELLULAR SystemsMMS	Mobile TCPFast retransmit / Fast recovery	MANET characteristicsROUTING
	SLO-2	Amplitude Shift Keying Frequency Shift Keying Phase Shift Keying- BPSK, QPSK	Time division Multiple Access Fixed ALOHA , Slotted ALOHA	UMTS Release and standards UMTS system architecture UTRAN	Transaction oriented TCP TCP over 2.5/3G wireless Networks	AODV Routing VANETCommunications in VANET
S-6	SLO-1	Multiplexing and multiple access techniques	Multiple Access with Collision Avoidance	Handover	Introduction to WAP WAP Architecture	Wireless Sensor Networks
S-7	SLO-1	Frequency-division multiplexing	Space division Multiple Access Code division Multiple Access	Satellite System Infrastructure- GEO, LEO, MEO	Wireless Datagram ProtocolWireless Transaction Protocol	RFID TechnologyTwo tags of RFID
	SLO-2	Time-division multiplexing	Spread ALOHA multiple Access	Limitations of GPS	Wireless Session Protocol	Wi-Fi Standards

S-8	SLO-1	*Code-division multiplexing*	*OFDM*	*GPSBeneficiaries of GPS*	*Wireless Transport Layer Security*	*WiMax Standards*
	SLO-2	*Spread spectrum modulation*	*Variants of OFDM*			
S-9	SLO-1	*frequency hopping Spread spectrum*	*Comparison of Multiple Access Technique*	*4G Cellular systems*	*Wireless Markup Language*	*Fem-to-Cell Network*
	SL0-2	*Direct Sequence Spread spectrum*		*4G Standards (LTE/WiMax)*	*Push Architecture*	*Push-to-talk technology for SMS*

Learning Resources

1. *Roy Blake, Wireless Communication Technology" CENGAGE learning, Sixth indian reprint 2013.*
2. *Dharma Prakash Agarwal, Qing-An Zeng , "Introduction to Wireless and Mobile Systems" CENGAGE learning, First edition 2014.*
3. *Jochen Schiller, "Mobile Communications", Addision Wesley, 2nd edition 2011.*
4. *Singal TL, "Wireless Communication", Tata McGraw Hill Education Private Limited.*
5. *G.I.Papadimitriou, A.S.Pomportsis, P.Nicopolitids, M.S.Obaidat, "Wireless Networks", John Wiley and Sons, 2003*
6. *Gray J.Mullet "Wireless Telecommunication System and Networks", CENGAGE learning, reprint 2014.*
7. *Upena Dalal, "Wireless Communication" Oxford University Press, First edition 2009.*
8. *Kaveh Pahlavan & Prashant Krishnamurthy, "Wireless Networks" PHI 2002.*
9. *Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley Dreamtech India Pvt.Ltd., 2014.*

Learning Assessment

	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (15%)		CLA – 3 (15%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	*40 %*	-	*30 %*	-	*30 %*	-	*30 %*	-	*30%*	-
	Understand										
Level 2	Apply	*40 %*	-	*40 %*	-	*40 %*	-	*40 %*	-	*40%*	-
	Analyze										
Level 3	Evaluate	*20 %*	-	*30 %*	-	*30 %*	-	*30 %*	-	*30%*	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Dr.Madan Lakshmanan	*Prof. Subra Ganesan*	*Dr.S.Suresh*
Senior Scientist	*Professor, Electrical and Computer Engineering*	*Mrs.Jeya*
CEERI, CSIR, Chennai (R&D Industry)	*Oakland University, USA*	*Mr.H.Karthikeyan*