Course Code: ICE 413 **Credit : 3.0**
Course Title: Wireless & Mobile Communication **CIE Marks: 60**
SEE Marks: 40

Course Description:

Wireless Communication technology has become the most exciting area in telecommunication and networking. The rapid growth of mobile telephone use, various satellite services, and Wireless LANs are generating tremendous changes in telecommunications and networking. This course explores the technology, architecture design approaches and application of wireless and mobile communication technology.The course is designed to train the students extensively about different types of wireless and mobile communication networks and their technologies. This knowledge will help them to apply in their higher studies and professional field.

Course Learning Outcome (CLO):

CLO 1	To develop profound knowledge in wireless and mobile communication.
CLO 2	To analyze hands-on problems in wireless communication.
CLO 3	To design wireless and cellular networks.
CLO 4	To improve communication skill through presentation.
CLO 5	To develop leadership quality through Group work.
CLO 6	To build up decision making ability through assignment.
CLO 7	To expand confident by doing various practical problems.
CLO 8	To become efficient by solving real life problems through case studies.

Mapping of CLO to PO:

PO / CLO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO 1			*									
CLO 2			*		*							
CLO 3	*				*							
CLO 4		*			*							
CLO 5												
CLO 6												
CLO 7					*							
CLO 8						*						

Teaching Strategies (TS):

TS 1	Interactive Lecture/discussion using Online/multimedia or whiteboard.
TS 2	Group presentation regarding related problems and assigned task.
TS 3	Evaluation of class performances to reach each student in a class for the topic.
TS 4	Active discussion in class (online/onsite) regarding efficient solving of the logical and mathematical problems of communication systems

SI	Week	Course Content	Teaching Learning Strategy	Alignment with CLO	Assessment Strategy
1.	**Week 1&2**	**Lecture Module 1:** 1.1Intruduction to the course and necessarry meterials. 1.2Introduction to wireless communication & histoty . 1.3Transmission 1.4Fundamentals, Analog and Digital data transmission 1.5Channel capacity, Multiplexing.	Lecture, Discussion, Problem based learning, Exercise.	CLO1	Q/A, MCQ, Viva Voce
2.	**Week 3&4**	**Lecture Module 2:** 2.1Wireless communication networks, topologies. 2.2Switching techniques.Circuit Switching, Packet switching. 2.3 ATM	Lecture, Discussion, Problem based learning, Exercise.	CLO4	Assignment, Q/A, MCQ, Viva Voce, Observation
3.	**Week 5&6**	**Lecture Module 3:** 3.1 Antennas 3.2 Propagation modes. 3.3 Multi-path Propagation 3.4 Line of sight transmission 3.5 Fading in mobile environment.	Lecture, Discussion, Problem based learning, Exercise.	CLO1	Assignment, Q/A, MCQ, Viva Voce, Observation
4.	**Week 7&8**	**Lecture Module 4:** 4.1Signal encoding techniques 4.2Digital data analog signal, ASK, FSK, PSK, QPSK, MFSK, QAM. 4.3Analog data Digital signal, PCM, Delta modulation. 4.4 Spreading methods, FHSS, DSSS, CDMA. 4.5 Hamming code, CRC, Parity,	Lecture, Discussion, Problem based learning, Exercise.	CLO1	Assignment, Q/A, MCQ, Viva Voce, Observation

		4.6 Convolution, Turbo Coding.			
5.	**Week 9&10**	**Lecture Module 5:** 5.1Cellular wireless networks. 5.2 Network organization, frequency reuse, hand-off 5.3 Capacity planning. 5.4 Cellular network calling system.	Lecture, Discussion, Problem based learning, Exercise.	CLO4	Assignment, Q/A, MCQ, Viva Voce, Observation
6.	**Week 11**	**Lecture Module 6:** 6.1 First Generation analog. 6.2 Second generation TDMA. 6.3 2nd Generation Cellular Network. 6.4 Evolution of 2.5 G wireless networks. 6.5 3rd Generation Wireless networks.	Lecture, Discussion, Problem based learning, Exercise.	CLO3	Assignment, Q/A, MCQ, Viva Voce, Observation
7.	**Week 12&13**	**Lecture Module 7:** 7.1 Introduction to GSM 7.2 GSM service model, basic model and Architecture. 7.3 GSM cell structure and size.Handover in GSM. 7.4 GSM network planning.	Lecture, Discussion, Problem based learning, Exercise.	CLO1	Assignment, Q/A, MCQ, Viva Voce, Observation
8.	**Week 14 & 15**	**Lecture Module 8:** 8.1 CDMA, IS-95, DSSS 8.2 CDMA transmission system. 8.3 Rake receiver, CDMA Hand-off.	Lecture, Discussion, Problem based learning, Exercise.	CLO4	Assignment, Q/A, MCQ, Viva Voce, Observation
9.	**Week 16 & 17**	**Lecture Module 9:** 9.1 Cordless Telephone System 9.2 Wireless Local Loop 9.3 Mobile Ad-hoc networking. 9.4 Ad-hoc Network Routing Protocols.	Lecture, Discussion, Problem based learning, Exercise.	CLO1	Assignment, Q/A, MCQ, Viva Voce, Observation
10.	**Week 18 & 19**	**Lecture Module 10:** 10.1 WLAN technology 10.2 Infrared LAN	Lecture, Discussion, Problem based learning, Exercise.	CLO1	Assignment, Q/A, MCQ, Viva Voce, Observation
11.	**Week 20**	**Module 11:**	Lecture, Discussion		Presentation

		Course Review, Discussions & Presentation, Course Assignment.			

Assessment Procedure:

CIE (Continuous Internal Evaluation)- 60 Marks

Bloom's Criteria	Attendance (07)	Quiz (15)	Assignment (5)	Presentation (8)	Mid Term Exam (25)
Remember		**5**			
Understand		**5**	**2**	**2**	**5**
Apply		**5**		**2**	**10**
Analyse			**3**	**2**	**5**
Evaluate				**2**	**5**
Create					

CIE (Continuous Internal Evaluation-Lab)- 100 Marks

Bloom's Criteria	Attendance (10)	Lab Performance (25)	Lab Report (25)	Lab Final (40)
Remember				
Understand		**5**	**5**	**5**
Apply		**5**	**5**	**10**
Analyse		**5**	**5**	**10**
Evaluate			**10**	**5**
Create		**10**		**10**

SEE (Semester End Examination)-40 Marks

Bloom's Criteria	Marks (40)
Remember	5
Understand	10
Apply	10
Analyse	10
Evaluate	5
Create	

Text Books:

1. Wireless Communications &Networking (2nd Edition) By William Stallings

Reference Books:

1. Wireless Communications (New Edition)By Theodore Rappaport
2. Wireless & Cellular Telecommunication (3rd Edition) By William C.Y Lee

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