



Department of Electronics & Telecommunication Engineering
Faculty of Engineering

Course Profile

Course Title: Wireless and Mobile Communication	Course Code: ETE 413	Prerequisite Course: ETE 315
Credit: 3.0	Total Mark: 100	Contact Hour: 3 hours per week

Rationale: 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.

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

Learning Outcomes	Course Content	Teaching Learning Strategy	Assessment Strategy
<ol style="list-style-type: none"> 1. Able to describe signal and system. 2. Able to explain signal properties. 3. Able to differentiate between systems. 4. Able to design a system according to demand. 	<p>Lecture Module 1:</p> <ol style="list-style-type: none"> 1.1 Introduction to the course and necessary materials. 1.2 Introduction to wireless communication & history. 1.3 Transmission 1.4 Fundamentals, Analog and Digital data transmission 	<p>Lecture, Discussion, Problem based learning, Exercise.</p>	<p>Q/A, MCQ, Viva Voce</p>

	1.5 Channel capacity, Multiplexing.		
<ol style="list-style-type: none"> 1. Able to learn wireless networks and their topologies. 2. Able to differentiate between different switching techniques and their applications. 	Lecture Module 2: 2.1 Wireless communication networks, topologies. 2.2 Switching techniques. Circuit Switching, Packet switching. 2.3 ATM	Lecture, Discussion, Problem based learning, Exercise.	Assignment, Q/A, MCQ, Viva Voce, Observation
<ol style="list-style-type: none"> 1. Able to learn omnidirectional and directional antennas and their applications. 2. Able to explain wireless propagation modes. 3. Able to calculate antenna gain, path-loss, LOS and fading in wireless communication. 	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.	Assignment, Q/A, MCQ, Viva Voce, Observation
<ol style="list-style-type: none"> 1. Able to learn Digital and Analog signal Encoding Techniques. 2. Able to learn spreading methods. 3. Able to learn different error detection control methods. 	Lecture Module 4: 4.1 Signal encoding techniques 4.2 Digital data analog signal, ASK, FSK, PSK, QPSK, MFSK, QAM. 4.3 Analog data Digital signal, PCM, Delta modulation. 4.4 Spreading methods, FHSS, DSSS, CDMA. 4.5 Hamming code, CRC, Parity, 4.6 Convolution, Turbo Coding.	Lecture, Discussion, Problem based learning, Exercise.	Assignment, Q/A, MCQ, Viva Voce, Observation
<ol style="list-style-type: none"> 1. Able understand cellular networks. 2. Able to create capacity and frequency planning. 3. Able to illustrate a cellular calling system. 	Lecture Module 5: 5.1 Cellular 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.	Assignment, Q/A, MCQ, Viva Voce, Observation
<ol style="list-style-type: none"> 1. Able to learn Cellular network Generations and Functions. 2. Able to differentiate between different generations. 	Lecture Module 6: 6.1 First Generation analog. 6.2 Second generation TDMA. 6.3 2 nd Generation Cellular Network. 6.4 Evolution of 2.5 G wireless networks. 6.5 3 rd Generation Wireless networks.	Lecture, Discussion, Problem based learning, Exercise.	Assignment, Q/A, MCQ, Viva Voce, Observation

1. Able to learn about GSM technology. 2. Able to create a GSM network model.	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.	Assignment, MCQ, Viva Voce, Q/A, Observation
1. Able to understand CDMA transmission system.	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.	Assignment, MCQ, Viva Voce, Q/A, Observation
1. Able to learn Cordless Telephone system. 2. Able to Learn WLL. 3. Able to learn Wireless Ad-hoc networks and routing protocols.	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.	Assignment, MCQ, Viva Voce, Q/A, Observation
1. Able to learn WLAN. 2. Able to understand infrared LAN technology.	Lecture Module 10: 10.1 WLAN technology 10.2 Infrared LAN	Lecture, Discussion, Problem based learning, Exercise.	Assignment, MCQ, Viva Voce, Q/A, Observation
1. Able to realize the outcome of the course and its application in professional field.	Module 11: Course Review, Discussions & Presentation, Course Assignment.	Lecture, Discussion	Presentation

Recommended Books and Materials	
Text Books: 1. Wireless Communications & Networking (2nd Edition) By William Stallings	References: 1. Wireless Communications (New Edition) By Theodore Rappaport 2. Wireless & Cellular Telecommunication (3rd Edition) By William C.Y Lee

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