UNIVERSITI TEKNOLOGI MARA

ITT640: WIRELESS NETWORKS

Course Name (English)	WIRELESS NETWORKS APPROVED
Course Code	ITT640

MQF Credit	3

Course Description	This course addresses the fundamental concept, current and emerging technologies, standards, and protocols, related to Wireless Networks. Topics covered include: Wireless Transmission Fundamentals, Wireless Medium Access Control, WPAN, WLAN, WWAN, Satellite Communications and WLAN Deployment. At the end of the course, students are required to design a WLAN using simulation software.

Transferable Skills	Knowledge, Cognitive, Affective

Teaching Methodologies	Lectures, Tutorial, Presentation, Project-based Learning

CLO	CLO1	Describe the fundamental concept, technologies, standards, and protocols, related to Wireless Networks.
	CLO2	Design a Wireless Local Area Network using appropriate methods and tools.
	CLO3	Synthesize the simulation results of the designed Wireless Local Area Network.

Pre-Requisite Courses	No course recommendations

Topics
1. Introduction to Wireless Networks 1.1) History 1.2) Why Wireless 1.3) Wireless Technologies 1.4) Current Technologies Issues and Limitations 1.5) Future Direction of Wireless Technology
2. Wireless Transmission Fundamentals 2.1) Wireless Transmission Media (Infrared, Broadcast Radio, Cellular Radio, Microwaves, Communication Satellites) 2.2) Frequencies 2.3) Signal and Propagation 2.4) Wireless Transmission Techniques 2.5) Signal Modulation and Demodulation
3. Wireless Medium Access Control 3.1) Contention-free Protocols (circuit switching) 3.2) FDMA 3.3) TDMA 3.4) CDMA 3.5) Contention-based Protocols (packet switching) 3.6) CSMA/CA 3.7) MACA 3.8) MACAW
4. Wireless Personal Area Networks (WPAN) 4.1) Wireless LANs Topologies 4.2) Overview of IEEE 802.11 Standards 4.3) IEEE 802.11 Topologies 4.4) IEEE 802.11 Medium Access Mechanisms 4.5) Mobile Ad Hoc Networks (MANET)

5. Wireless Local Area Networks (WLAN)
5.1) Wireless LANs Topologies
5.2) Overview of IEEE 802.11 Standards
5.3) IEEE 802.11 Topologies
5.4) IEEE 802.11 Medium Access Mechanisms
5.5) Mobile Ad Hoc Networks (MANET)

6. Wireless Wide Area Networks (WWAN)
6.1) Wireless WANs Overview
6.2) Cellular Network Concept
6.3) 1G-5G Networks
6.4) GSM, GPRS, UMTS, LTE, 5G
6.5) Propagation Effects and Handoff

7. Satellite Communications
7.1) Satellite Communications Overview
7.2) Types of Satellites
7.3) Global Positioning System (GPS)

8. Deploying Wireless LANs
8.1) Wireless LANs Deployment and Application Impact
8.2) Wireless LANs Deployment Planning
8.3) Site Survey
8.4) Monitoring and Controlling Wireless Network
8.5) Managing Wireless Networks.

9. Selected Topics in Current Wireless Network
9.1) Current Issues in WPAN
9.2) Current Issues in WLAN
9.3) Current Issues in WWAN
9.4) Current Issues in Satellite Communications

10. Wireless LAN Simulation Tools
10.1) N/A

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Group Project	Students will work in groups and have to design a WLAN. Students need to submit report detailing the methods of designing the WLAN together with the proposed WLAN design. In addition, the report should consist of synthesized simulation results.	30%	CLO3
	Presentation	Students will present the wireless network that they have designed for the Group Project	10%	CLO2
	Test	Topics covered: chapter 1 to chapter 4.	20%	CLO1

Reading List	Recommended Text	• Sarhan M. Musa 2021, *Wireless Networks Technology and Cybersecurity*, 1 Ed., 9, Mercury Learning & Information
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	