

Module code	TF-4304		
Module Title	Mobile and Wireless Network Systems		
Degree/Diploma	Bachelor of Engineering (Information Communication Systems)		
Type of Module	Major Option		
Modular Credits	4	Total student Workload	8 hours/week
		Contact hours	4 hours/week
Prerequisite	None		
Anti-requisite	None		
Aims			
To emphasise different wireless and mobile network systems, their protocol architecture and setup using different wireless data services.			
Learning Outcomes			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order:	20%	<ul style="list-style-type: none"> - identify and assess network operations using Syslog and SNMP - configure wireless LANs using different wireless technologies and analyse the network for different performance metrics 	
Middle order:	40%	<ul style="list-style-type: none"> - investigate and describe network architectures - design the selection criteria of network devices and WAN technologies to meet network requirements 	
Higher order:	40%	<ul style="list-style-type: none"> - perform experiments to populate different networks and analyse protocols at different layers to establish that type of network - perform and troubleshoot network devices and resolve common issues with data link protocols 	
Module Contents			
<ul style="list-style-type: none"> - Spread spectrum: Antenna pros and cons, Omni Antenna vs Directional, Mesh Networks, Coding and error control, Frequency Hopping Spread Spectrum, Direct Sequence Spread Spectrum, Code Division Multiple Access, PN Sequences - Wireless LAN: WLAN requirements and basics, IEEE 802.11 protocol architecture, MAC protocol CSMA/CA, mac frame, Handoff, PHY layer, Access techniques - Cellular Network concept: Cellular concept, Coverage Capacity, Cellular network architecture, Handoff, Difficulty in Handoff detection, Location area-based protocols, and interferences - Bluetooth: Piconets and Scatternet, Frequency Hopping scheme, Bluetooth protocol architecture, Physical links - Mobile Ad hoc network: MACAW MAC Layer protocol, Transport layer protocols, Routing in Ad Hoc Networks, AODV, DSR, DSDV - Mobile and Wireless Network generations: 1G, GSM, Generalized Packet Radio Service (GPRS), Universal Mobile Telecommunications System, LTE, LTE architecture, Control and user planes, Small cell concept, Interference among cells - 5G: Massive capacity support, Ubiquitous support, 5G Frequencies, Cloud-RAN - Overview to satellite networks: Physical, Architectural, Modern modulation, Coding, Multiple access schemes 			
Assessment	Formative assessment	Monthly online multiple choice and a report on experiments completed will be used to evaluate their learning	
	Summative assessment	Examination: 40% Coursework: 60% <ul style="list-style-type: none"> - 1 assignment (30%) - 2 laboratory tests (15% each) 	

