MULTIMEDIA UNIVERSITY ®

COURSE INFORMATION

1.	**Name of Course**	Data Communications and Networking
2.	**Course Code**	TDC 1231
3.	**Type of Course** (e.g. : Core, major, elective etc.)	Common Core for B.IT (Hons) Data Communications and Networking B.IT (Hons) Information Technology Management B.IT (Hons) Artificial Intelligence B.IT (Hons) Security Technology B.Sc (Hons) Bioinformatics
4.	**Synopsis**	By the end of study, students should be able to demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to data communications and networking.
5.	**Version** (State the date of theSenate's approval - previous and the current approval date)	Date of previous version: June 2014 Date of current version: August 2017
6.	**Name(s) of Academic Staff**	Lillian Wang Yee Kiaw Ibrahim Yusof
7.	**Semester and Year Offered**	Trimester 2, Year 1
8.	**Credit Value** (if no changes to content, then faculty to vet)	4
	Credit Value (only if changes in credit value results in changes in content. If no changes to content, then faculty to vet)	
9.	**Pre-Requisite**	None
10.	Objective of the course in the programme: (i) To provide students with concepts of data communications and networking. (ii) To deliver the fundamentals of Communication Architecture, Protocols and Local Area Networks. (iii) To expose the various types of network in terms of the technologies, hardware, and usage.	
11.	**Justification for including the course in the programme:** As one of the fastest growing technologies in our culture today, data communications and networking presents a unique challenge for IT industry. Knowledge of data communications and networking is crucial to today's IT professional. Virtually all computers are connected to some sort of network and exchange information with each other. This course will cover the topics of Network Models and Architecture, Interfacing and Communication, Fault Tolerance and System Performance Evaluation. A student project of sufficient rigor will be the core of this course and the project will be retained in the IS student's permanent portfolio for future use. This course provides students with familiarity with the core concepts of networking, including awareness of the existence of protocols; an understanding of hardware such as routers and hubs and switches, common operating systems, basic systems and IP Network security.	

12.	**Course Learning Outcomes (CLO)**		**Domain**	**Level**
	CLO1:	Demonstrate understanding on concepts of data communication, data transmission, and transmission media.	Cognitive	1 ~~3~~

	CLO2:	Understand the data transmission techniques, data encoding and modulation, and data communication interface.	Cognitive	2
	CLO3:	Demonstrate understanding on data link control, multiplexing, circuit and packet switching.	Cognitive	2
	CLO4:	Understand the applications of LAN technology and systems.	Cognitive	1

13. Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment:

Course Learning Outcomes (CLO) (Must tally with CLOs in item 12)	Programme Learning Outcomes (PLO)								Teaching Methods	Assessment Method
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8		
CLO1.	√								Lecture, Tutorial	Quiz, Test, Final exam
CLO2		√							Lecture, Tutorial	Quiz, Test, Final exam
CLO3							√		Lecture, Tutorial, Lab	Quiz, Test, Lab, Final exam
CLO4								√	Lecture, Tutorial	Quiz, Test, Final exam
Total	**1**	**1**					**1**	**1**	*Indicate the relevancy between the CLO and PLO by ticking "✓" the appropriate relevant box (This description must be read together with standards 2.1.2, 2.2.1, and 2.2.2 in Area 2 – pages 16 & 18 of COPPA 2.0)*	

14. Transferable Skills:
• Technical skills,• Team work,• Problem solving

15 Distribution of Student Learning Time (SLT)

Course Content Outline	**CLO	Teaching and Learning Activities				Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
		Guided Learning (F2F)*						
		*L	*T	*P	*O			
1. Introduction Data Communications. Data Communication Networking. Protocols and Protocol Architecture (TCP/IP and OSI). Compare TCP/IP architecture and OSI model. Standards Organizations.	CLO 1	3	2				5	10
2. Data Transmission Transmission Terminology. Frequency, Spectrum and Bandwidth. Transmission Impairments. Nyquist's and Shannon's Law.	CLO 1	2	2			1	5	10
3. Transmission Media Guided and Unguided. Twisted pair. Coaxial cable. Fibre optic. Microwave. Cellular. Satellite.	CLO 1	2	2			1	5	10

Topic	CLO						
4. Data Encoding and Modulation Digital to Digital: NRZ-L, NRZ-I, Bipolar-AMI, Pseudoternary, Manchester, Differential Manchester. Modulation Rate. Digital to Analog: Amplitude Shift keying (ASK), Frequency Shift keying (ASK), Phase Shift keying (PSK). Analog to Digital: PCM. Analog to Analog: Amplitude Modulation, Frequency Modulation, Phase Modulation**.**	CLO 2	4	2		1	7	14
5. Data Communication Interface Synchronous and Asynchronous Transmission. Line Configurations: Simplex, Half-duplex, Full duplex. EIA-232 Interface Standard. DTE and DCE. Null Modem.	CLO 2	1	2		1	4	8
6. Data Link Control Flow Control: Stop-and Wait, Sliding Window. Error Detection: Parity Check, CRC Methods. HDLC: Characteristics, Frame Structure, and Operation.	CLO 3	4	2		1	7	14
7. Multiplexing Frequency Division Multiplexing: Characteristics. Synchronous Time Division Multiplexing: Characteristics, Link Control, Digital Carrier Systems, And Statistical Time Division Multiplexing: Characteristics. ADSL and HDSL Line.	CLO 3	3		2	1	6	12
8. Circuit Switching and Packet Switching Introduction: Switching Networks, Circuit Switching Networks, Circuit Switching Concepts. Routing in Circuit Switching Networks. Introduction to Control Signalling: SS7. Packet Switching: Technique, Packet Size, Compare Circuit Switching and Packet Switching.	CLO 3	4		2	1	7	14
9. LAN Technology LAN Applications. LAN Architecture: Protocol Architecture, Topologies, MAC, LLC. Bus LAN: Characteristics, Media, and Use of Repeater in extension of BUS. Ring LAN: Characteristics. Star LAN: Characteristics, Use of Hubs and Switches. Wireless LAN: Applications, Requirements, and Technology. Bridge: Function of a Bridge, Protocol Architecture.	CLO 4	4	2		1	7	14
10. LAN Systems Ethernet (CSMA/CD): IEEE 802.3 MAC, IEEE 802.3 10 Mbps Specifications (10Base5, 10Base2, 10Base-T, 10Base-F). IEEE 802.3 100 Mbps Specifications: Introduction to Fast Ethernet and Gigabit Ethernet. Token ring: IEEE 802.5 MAC, Physical Layer specifications. FDDI: MAC, Physical Layer specifications. Wireless LAN Standard: IEEE 802.11 Physical Layer Specifications and MAC.	120	4	2		1	7	14
						Total SLT	**120**

SUMMATIVE ASSESSMENT		
1. Continuous Assessment	**Percentage %**	**Total SLT**
Online/Written quizzes	10%	10
Lab submissions	10%	0

		Percentage %	Total SLT	
	Tutorial submissions	10%	0	
	Written test	20%	10	
Total SLT for Continuous Assessment			**20**	

2. Final Assessment	Percentage %	Total SLT	
		F2F	**ILT**
Final Exam	50%	2	18
Total SLT for Final Assessment (F2F + NF2F)		**20**	

Grand Total	**100%**	**160**

16	.	**Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): NA**
17	.	**Main References:** Behrouz Forouzan, (2012). Data Communications and Networking, 5th Ed. McGraw-Hill.
18	.	**Additional References:** 1. William Stallings, (2013). Data & Computer Communications, 10th Ed. Prentice Hall.

Note:

	Cells shaded light grey contain formulas / fixed values. Edit these formulas only if needed.

Legend:

	Requires Faculty's Approval, ADC's Endorsement and Senate's Noting
	Requires ACC's Recommendation, ADC's Approval and Senate's Endorsement