MULTIMEDIA UNIVERSITY®

COURSE INFORMATION

1.	**Name of Course**	Computer Networks
2.	**Course Code**	TSN2201
3.	**Type of Course** **(e.g. : Core, major, elective etc.)**	Core
4.	**Synopsis**	Computer architecture and organization addresses the fundamental principles in computer design, from the basic buidling blocks of number systems, data representation and digital systems to microprocessor design, memory and input/output strategies.
5.	**Version** **(State the date of theSenate's approval - previous and the current approval date)**	Current: January 2018 Previous: June 2016
6.	**Name(s) of Academic Staff**	Chan Wai Kok Khor Kok Chin Bhawani A/P S.Selvaretnam Chikkannan Eswaran
7.	**Semester and Year Offered**	Trimester 2 (Beta)
8.	**Credit Value**	4 credit hours
9.	**Pre-Requisite**	Nil

10. **Objective of the course in the programme:**

• To understand the fundamental concepts of data communications and networking in architecture, protocol, security, management LAN and WAN,
• To acquire basic hands-on skills in configuring routing, switching and basic services for a medium size network

11. **Justification for including the course in the programme:**

This course provides students with the knowledge required to perform basic network setup and configuration.

12. **Course Learning Outcomes (CLO)**

		Domain	Level
CLO1:	Describe the basic concepts of networking including network layers, devices, security and network management	Cognitive	2
CLO2:	Construct various networking topology using routing and switching technologies.	Cognitive	3
CLO3:	Analyze the operation of the TCP/IP networks including networking protocols and routing algorithms.	Cognitive	4

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	PLO9	PLO10	PLO11	PLO12		
CLO1	✓	✓											Lecture/Practical	lab Test/Assignment/Test/Final Exam
CLO2	✓		✓										Lecture/Practical	lab Test/Assignment/Final Exam
CLO3		✓	✓										Lecture/Practical	lab Test/Assignment/Test/Final Exam
Total	**2**	**3**	**4**										*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:**

Critical thinking

15. **Distribution of Student Learning Time (SLT)**

	Course Content Outline	**CLO	Teaching and Learning Activities – Guided Learning (F2F)* *L	*T	*P	*O	Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
1	**Introduction Data Communications. Data Communication Networking. Protocols and Protocol Architecture (TCP/IP and OSI). Compare TCP/IP architecture and OSI model. Standards Organizations. IEEE, ISO.**		1		2		2	3	8
2	**Physical Layer Transmission Terminology. Frequency, Spectrum and Bandwidth. Transmission Impairments. Nyquist's and Shannon's Law. Guided and Unguided. Twisted pair. Coaxial cable. Fibre optic. Microwave. Cellular. Satellite.**		2		2		4	4	12
3	**Data Link Layer Protocol Error detection and correction: Parity check, CRC methods, HDLC protocols, Multiple Access protocols: Random access, Controlled and Channelization protocols**		2		2		4	4	12
4	**4. LAN Technology Wired LANs, MAC&LLC sublayers, Ethernets: standard, bridged, full – duplex, fast and gigabit Ethernets , WirelessLANs,IEEE802.11,Bluetooth:Architecture and Layers**		1		2		2	3	8

	5	**Network Layer IPv4 & IPv6 addressing and structure, NAT, Address mapping and error reporting protocols: ARP,DHCP,ICMP,IGMP, Routing protocols : Open Shortest Path First(OSPF), RIP (Routing Information Protocol)(RIP), Border gateway(BGP)**		3		3		12	6	24
	6	**Transport Layer Process-to-Process delivery, Connectionless vs connection-oriented service UDP, User Datagram Format,UDPoperation, TCP,TCP Segment Format,TCP connection, Flow control**		1		2		2	3	8
	7	**Application Layer DNS, Email, FTP, Telnet, WWW and HTTP, Client-Server paradigm**		3		2		10	5	20
	8	**Congestion Control and QoS Open-loop and closed loop controls,Congestion control in TCP,QoS characteristics,Scheduling and traffic shaping techniques**		1		2		2	3	8
	9	**Network Management and Security Components of network management system, SNMP, Cryptography, Internet security, Network, Transport and Application layer security, Firewall**		1		2		2	3	8
									Total SLT	**108**

SUMMATIVE ASSESSMENT

1. Continuous Assessment	**Percentage %**	**Total SLT**
Lab Test	20%	8
Mid Term	10%	5
Assignments	20%	17
	Total SLT for Continuous Assessment	**30**

2. Final Assessment	**Percentage %**	**Total SLT**	
		F2F	**ILT**
Final Exam	50%	2	20
	Total SLT for Final Assessment (F2F + NF2F)	**22**	
Grand Total	**100%**	**160**	

****Indicate the CLO based on the CLO's numbering in Item 12.**
***L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face**

16 . **Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room):**
eNSP Simulator, Packet Tracer, Cisco Routers,

17 . **Main References:**
B.A.Forouzan, "Data Communications and Networking" 5th Edition, McGraw-Hill 2013

18 . **Additional References:**

1. William Stallings, Data and Computer Communications. 10th edition, Prentice Hall. 2014
2. Kevin R.Fall and W.Richard Stevens, TCP/IP Illustrated, Volume 1: The Protocol. 2nd Edition. Addison-Wesley. 2012.
3. Ying-Dar Lin, Computer Networks: An Open Source Approach. McGraw-Hill Publishing. 2011
4. B.A.Forouzan, "TCP/IP protocol suite" Fourth Edition,McGraw-Hill,2010
5. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks. 5th edition. Prentice-Hall. 2010

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