

Subject Description Form

Subject Code	COMP2322					
Subject Title	Computer Networking					
Credit Value	3					
Level	2					
Pre-requisite / Co-requisite / Exclusion	Pre-requisite: COMP1011/COMP1012/ENG2002					
Objectives	The key objective of this subject is to acquire a foundational understanding of computer communications technologies. Emphasis will be on the link layer and above. Networking concepts will be illustrated using the TCP/IP and ATM networks.					
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p><u>Professional/academic knowledge and skills</u></p> <p>(a) acquire a good knowledge of the computer network, its architecture and operation;</p> <p>(b) understand and apply the principles and practices of computer networks;</p> <p>(c) realise network communication skills through programming;</p> <p><u>Attributes for all-roundedness</u></p> <p>(d) follow trends of computer networks; and</p> <p>(e) build up on team work, presentation and technical writing skills.</p>					
Subject Synopsis/ Indicative Syllabus	<table><tr><td>Topic</td></tr><tr><td>1. Fundamentals Networking basics; layering concept; protocols; data encapsulation; OSI reference model; TCP/IP reference model; performance evaluation.</td></tr><tr><td>2. Data Link and MAC Sublayer Data link layer basics; framing; error detection; automatic repeat request protocols; LAN; link layer and MAC protocols.</td></tr><tr><td>3. Network Layer Network layer basics; connection-oriented and connectionless networks; routing/forwarding mechanisms; distance vector and link state routing algorithms; IP basics; IP addressing and subnets; address resolution protocol.</td></tr><tr><td>4. Transport Layer User Datagram Protocol (UDP); Transmission Control Protocol (TCP).</td></tr></table>	Topic	1. Fundamentals Networking basics; layering concept; protocols; data encapsulation; OSI reference model; TCP/IP reference model; performance evaluation.	2. Data Link and MAC Sublayer Data link layer basics; framing; error detection; automatic repeat request protocols; LAN; link layer and MAC protocols.	3. Network Layer Network layer basics; connection-oriented and connectionless networks; routing/forwarding mechanisms; distance vector and link state routing algorithms; IP basics; IP addressing and subnets; address resolution protocol.	4. Transport Layer User Datagram Protocol (UDP); Transmission Control Protocol (TCP).
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	<div>5. Application Layer</div> <div>Networking applications.</div> <div>Laboratory Experiment:</div> <div>Laboratory exercises on networking such as socket programming and IP-based applications.</div> <div>Case Study:</div> <div>Networking technologies and applications.</div>						
Teaching/ Learning Methodology	Teaching is mainly conducted through lectures. Learning is supplemented by exercises in labs/tutorials. Students are assessed through assignments, a project, a mid-term test and an examination.						
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				
			a	b	c	d	e
	Continuous Assessment	55%					
	1. Assignments		✓	✓		✓	
	2. Project		✓	✓	✓	✓	✓
	3. Mid-Term		✓	✓			
	Examination	45%	✓	✓		✓	
	Total	100%					
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:						
	The project is used to assess all learning outcomes.						
The assignments and mid-term test are used as continuous assessment methods to assess students' knowledge and understanding about the subject.							
Finally, students are assessed by a formal examination.							
Student Study Effort Expected	Class contact:						
	▪ Lecture				39 Hrs.		
	▪ Tutorial/Lab				13 Hrs.		
	Other student study effort:						
	▪ Self-study				53 Hrs.		

	Total student study effort	105 Hrs.
Reading List and References	<p>Textbook:</p> <ol style="list-style-type: none"> Peterson, L. and Davie, B., <i>Computer Networks: A Systems Approach</i>, 4th Edition, Morgan Kaufmann, 2007. <p>Reference Books:</p> <ol style="list-style-type: none"> Stevens, W. R., <i>TCP/IP Illustrated Volume I, The Protocols</i>, Addison Wesley, 1994. Tanenbaum, A. S., <i>Computer Networks</i>, 5th Edition, Prentice Hall, 2010. Comer, D. E., <i>Internetworking with TCP/IP: Volume I - Principles, Protocols, and Architecture</i>, 5th Edition, Prentice Hall, 2006. Keshav, S., <i>An Engineering Approach to Computer Networking: ATM Networks, the Internet, and the Telephone Network</i>, Addison Wesley Longman, 1997. Stallings, W., <i>High-speed Networks and Internets: Performance and Quality of Service</i>, 2nd Edition, Prentice Hall, 2002. Stallings, W., <i>Network and Internetwork Security: Principles and Practice</i>, IEEE Press, 1995. Stevens, W. R., <i>Unix Network Programming, Volume 1: The Sockets Networking API</i>, 3rd Edition, Addison-Wesley Professional, 2003. 	