

Subject Description Form

Subject Code	COMP2322					
Subject Title	Computer Networking					
Credit Value	3					
Level	2					
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: COMP1011 Co-requisite/Exclusion: Nil					
Objectives	The key objective 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><i>Professional/academic knowledge and skills</i></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) realize network communication skills through programming;</p> <p><i>Attributes for all-roundedness</i></p> <p>(d) follow trends of computer networks;</p> <p>(e) build up on team work, presentation and technical writing skills.</p>					
Subject Synopsis/ Indicative Syllabus	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Topic</th> </tr> </thead> <tbody> <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> </tbody> </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.
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Teaching/ Learning Methodology	<p>Laboratory Experiment: Laboratory exercises on networking such as socket programming and IP-based applications.</p> <p>Case Study: Networking technologies and applications.</p> <p>Teaching is mainly conducted through lectures.</p> <p>Learning is supplemented by exercises in labs/tutorials.</p> <p>Students are assessed through assignments, a project, a mid-term test and an examination.</p>																																																					
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1"> <thead> <tr> <th data-bbox="432 1093 759 1261" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="759 1093 919 1261" rowspan="2">% weighting</th> <th colspan="6" data-bbox="919 1093 1453 1193">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="919 1193 1007 1261">a</th> <th data-bbox="1007 1193 1094 1261">b</th> <th data-bbox="1094 1193 1182 1261">c</th> <th data-bbox="1182 1193 1270 1261">d</th> <th data-bbox="1270 1193 1358 1261">e</th> <th data-bbox="1358 1193 1453 1261"></th> </tr> </thead> <tbody> <tr> <td data-bbox="432 1261 759 1328">1. Assignments</td> <td data-bbox="759 1261 919 1395" rowspan="3">55%</td> <td data-bbox="919 1261 1007 1328">✓</td> <td data-bbox="1007 1261 1094 1328">✓</td> <td data-bbox="1094 1261 1182 1328"></td> <td data-bbox="1182 1261 1270 1328">✓</td> <td data-bbox="1270 1261 1358 1328"></td> <td data-bbox="1358 1261 1453 1328"></td> </tr> <tr> <td data-bbox="432 1328 759 1395">2. Project</td> <td data-bbox="919 1328 1007 1395">✓</td> <td data-bbox="1007 1328 1094 1395">✓</td> <td data-bbox="1094 1328 1182 1395">✓</td> <td data-bbox="1182 1328 1270 1395">✓</td> <td data-bbox="1270 1328 1358 1395">✓</td> <td data-bbox="1358 1328 1453 1395"></td> </tr> <tr> <td data-bbox="432 1395 759 1462">3. Mid-term</td> <td data-bbox="919 1395 1007 1462">✓</td> <td data-bbox="1007 1395 1094 1462">✓</td> <td data-bbox="1094 1395 1182 1462"></td> <td data-bbox="1182 1395 1270 1462"></td> <td data-bbox="1270 1395 1358 1462"></td> <td data-bbox="1358 1395 1453 1462"></td> </tr> <tr> <td data-bbox="432 1462 759 1529">4. Examination</td> <td data-bbox="759 1462 919 1529">45%</td> <td data-bbox="919 1462 1007 1529">✓</td> <td data-bbox="1007 1462 1094 1529">✓</td> <td data-bbox="1094 1462 1182 1529"></td> <td data-bbox="1182 1462 1270 1529">✓</td> <td data-bbox="1270 1462 1358 1529"></td> <td data-bbox="1358 1462 1453 1529"></td> </tr> <tr> <td data-bbox="432 1529 759 1597">Total</td> <td data-bbox="759 1529 919 1597">100 %</td> <td colspan="6" data-bbox="919 1529 1453 1597"></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>The project is used to assess all learning outcomes.</p> <p>The assignments and mid-term test are used as continuous assessment methods to assess students' knowledge and understanding about the subject.</p> <p>Finally, students are assessed by a formal examination.</p>		Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d	e		1. Assignments	55%	✓	✓		✓			2. Project	✓	✓	✓	✓	✓		3. Mid-term	✓	✓					4. Examination	45%	✓	✓		✓			Total	100 %						
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Student Study Effort Expected	Class contact:																																																					
	<ul style="list-style-type: none"> ▪ Lecture 	39 Hrs.																																																				

	<ul style="list-style-type: none"> ▪ Tutorial/Lab 	13 Hrs.
	Other student study effort:	
	<ul style="list-style-type: none"> ▪ Self-study 	53 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	<p>Textbook:</p> <ol style="list-style-type: none"> 1. L. Peterson and B. Davie, Computer Networks: A Systems Approach, Fourth Edition, Morgan Kaufmann, 2007. <p>Reference Books:</p> <ol style="list-style-type: none"> 1. W. R. Stevens, TCP/IP Illustrated Volume I, The Protocols, Addison Wesley, 1994. 2. A. S. Tanenbaum, Computer Networks, Fifth Edition, Prentice Hall, 2010. 3. D. E. Comer, Internetworking with TCP/IP: Volume I - Principles, Protocols, and Architecture, Fifth Edition, Prentice Hall, 2006. 4. S. Keshav, An Engineering Approach to Computer Networking: ATM Networks, the Internet, and the Telephone Network, Addison Wesley Longman, 1997. 5. W. Stallings, High-speed Networks and Internets: Performance and Quality of Service, Second Edition, Prentice Hall, 2002. 6. W. Stallings, Network and Internetwork Security: Principles and Practice, IEEE Press, 1995. 7. W. R. Stevens, Unix Network Programming, Volume 1: The Sockets Networking API, Third Edition, Addison-Wesley Professional, 2003. 	