

## Subject Description Form

<b>Subject Code</b>	COMP2322					
<b>Subject Title</b>	Computer Networking					
<b>Credit Value</b>	3					
<b>Level</b>	3					
<b>Pre-requisite / Co-requisite/ Exclusion</b>	Pre-requisite: COMP1011 Co-requisite/Exclusion: Nil					
<b>Objectives</b>	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.					
<b>Intended Learning Outcomes</b>	<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>					
<b>Subject Synopsis/ Indicative Syllabus</b>	<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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<b>Teaching/ Learning Methodology</b>	<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>																																																					
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1"> <thead> <tr> <th data-bbox="462 1012 776 1180" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="776 1012 922 1180" rowspan="2">% weighting</th> <th colspan="6" data-bbox="922 1012 1425 1117">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="922 1117 1008 1180">a</th> <th data-bbox="1008 1117 1094 1180">b</th> <th data-bbox="1094 1117 1180 1180">c</th> <th data-bbox="1180 1117 1266 1180">d</th> <th data-bbox="1266 1117 1352 1180">e</th> <th data-bbox="1352 1117 1425 1180"></th> </tr> </thead> <tbody> <tr> <td data-bbox="462 1180 776 1243">1. Assignments</td> <td data-bbox="776 1180 922 1432" rowspan="3">55%</td> <td data-bbox="922 1180 1008 1243">✓</td> <td data-bbox="1008 1180 1094 1243">✓</td> <td data-bbox="1094 1180 1180 1243"></td> <td data-bbox="1180 1180 1266 1243">✓</td> <td data-bbox="1266 1180 1352 1243"></td> <td data-bbox="1352 1180 1425 1243"></td> </tr> <tr> <td data-bbox="462 1243 776 1306">2. Project</td> <td data-bbox="922 1243 1008 1306">✓</td> <td data-bbox="1008 1243 1094 1306">✓</td> <td data-bbox="1094 1243 1180 1306">✓</td> <td data-bbox="1180 1243 1266 1306">✓</td> <td data-bbox="1266 1243 1352 1306">✓</td> <td data-bbox="1352 1243 1425 1306"></td> </tr> <tr> <td data-bbox="462 1306 776 1369">3. Mid-term</td> <td data-bbox="922 1306 1008 1369">✓</td> <td data-bbox="1008 1306 1094 1369">✓</td> <td data-bbox="1094 1306 1180 1369"></td> <td data-bbox="1180 1306 1266 1369"></td> <td data-bbox="1266 1306 1352 1369"></td> <td data-bbox="1352 1306 1425 1369"></td> </tr> <tr> <td data-bbox="462 1369 776 1432">4. Examination</td> <td data-bbox="776 1369 922 1432">45%</td> <td data-bbox="922 1369 1008 1432">✓</td> <td data-bbox="1008 1369 1094 1432">✓</td> <td data-bbox="1094 1369 1180 1432"></td> <td data-bbox="1180 1369 1266 1432">✓</td> <td data-bbox="1266 1369 1352 1432"></td> <td data-bbox="1352 1369 1425 1432"></td> </tr> <tr> <td data-bbox="462 1432 776 1495">Total</td> <td data-bbox="776 1432 922 1495">100 %</td> <td colspan="6" data-bbox="922 1432 1425 1495"></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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<b>Student Study Effort Expected</b>	Class contact:																																																					
	<ul style="list-style-type: none"> <li>▪ Lecture</li> </ul>	39 Hrs.																																																				

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