

## Subject Description Form

<b>Subject Code</b>	COMP5327
<b>Subject Title</b>	Wireless Networking and Mobile Computing
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite / Co-requisite/ Exclusion</b>	Nil (but some knowledge in internet infrastructure and protocols is preferable)
<b>Objectives</b>	<p>After completing this subject, students will learn about:</p> <ul style="list-style-type: none"> <li>• enabling technologies for wireless networking and mobile computing</li> <li>• wireless networking standards</li> <li>• mobile computing applications</li> </ul>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <p><u>Professional/academic knowledge and skills</u></p> <ol style="list-style-type: none"> <li>a. understand wireless networking technologies and their applications;</li> <li>b. apply, design and/or evaluate related protocols and technologies;</li> <li>c. understand the trends and development of wireless networking and mobile computing.</li> </ol> <p><u>Attributes for all-roundedness</u></p> <ol style="list-style-type: none"> <li>d. participate in team work, presentation and technical writing.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<ul style="list-style-type: none"> <li>• Cellular Networks – Frequency Reuse, Access Protocols, Location Management, Handoff Management, 2G/3G/4G Cellular Network Standards</li> <li>• Wireless Local Area Networks – Overview of IEEE 802.11 Standard, Access Protocols, Mobility Management</li> <li>• Personal Area Networks / Bluetooth – Overview of Bluetooth Standard, Piconet and Scatternet, Frequency Hopping, Baseband Protocol, Link Manager Protocol, Logical Link Control and Adaption Protocol</li> <li>• Mobile/Wireless Security – Cellular Security, WiFi Security, Bluetooth Security</li> <li>• Location-aware Computing – GPS, Indoor Positioning Techniques, Location-aware Applications</li> <li>• Mobile Computing Applications – Mobile Apps, Case Studies</li> <li>• Other Selected Topics (e.g., Mobile IP, RFID, Sensors)</li> </ul>

<b>Teaching/Learning Methodology</b>	<p>Teaching is mainly conducted through lectures.</p> <p>Learning is supplemented by labs/tutorials, seminars and e-learning methods, where applicable.</p> <p>Students are assessed through assignments, a project and an examination.</p>																																				
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" data-bbox="512 421 1469 902"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>1. Assignments</td> <td rowspan="2">55</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>2. Project</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Examination</td> <td>45</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>Total</td> <td>100</td> <td colspan="4"></td> </tr> </tbody> </table> <p>The project is used to assess all learning outcomes (a) – (d).</p> <p>The assignments are used as a continuous assessment method to assess learning outcomes (a) – (c) (e.g., students’ understanding of the technologies).</p> <p>Finally, students are assessed by a formal examination, covering learning outcomes (a) – (c).</p>				Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	1. Assignments	55	✓	✓	✓		2. Project	✓	✓	✓	✓	3. Examination	45	✓	✓	✓		Total	100				
Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)																																			
		a	b	c	d																																
1. Assignments	55	✓	✓	✓																																	
2. Project		✓	✓	✓	✓																																
3. Examination	45	✓	✓	✓																																	
Total	100																																				
<b>Student Study Effort Expected</b>	Class contact:																																				
	<ul style="list-style-type: none"> <li>▪ Class activities (lectures/tutorials/lab(s))</li> </ul>		39 Hrs.																																		
	Other student study effort:																																				
	<ul style="list-style-type: none"> <li>▪ Self-study, assignments, project, exam</li> </ul>		65 Hrs.																																		
	Total student study effort		<b>104 Hrs.</b>																																		
<b>Reading List and References</b>	<p><b>Books:</b></p> <p>Deitel, H. M., <i>et al.</i>, 2002, <i>Wireless Internet and Mobile Business: How to Program</i>, Prentice Hall.</p> <p>Garg, V., 2007, <i>Wireless Communications and Networking</i>, Morgan Kaufmann.</p> <p>Gast, M. S., 2005, <i>802.11 Wireless Networks: The Definitive Guide</i>, 2<sup>nd</sup> Edition, O’Reilly &amp; Associates.</p> <p>Jamalipour, A., 2003, <i>The Wireless Mobile Internet: Architectures, Protocols and Services</i>, John Wiley and Sons.</p> <p>Kamal, R., 2012, <i>Mobile Computing</i>, 2<sup>nd</sup> Edition, Oxford University Press.</p> <p>Norris, M., 2001, <i>Mobile IP Technology for M-Business</i>, Artech House.</p> <p>Pandya, R., 2000, <i>Mobile and Personal Communication Systems and Services</i>,</p>																																				

IEEE Press.

Perkins, C. E., 1998, *Mobile IP: Design Principles and Practices*, Addison-Wesley.

Sadeh, N. M., 2002, *M-Commerce: Technologies, Services, and Business Models*, John Wiley and Sons.

Sauter, M., 2017, *From GSM to LTE-Advanced Pro and 5G: An Introduction to Mobile Networks and Mobile Broadband*, 3<sup>rd</sup> Edition, Wiley.

Smith, C. and Collins, D., 2014, *Wireless Networks*, 3<sup>rd</sup> Edition, McGraw-Hill Education.

Stallings, W., 2005, *Wireless Communications and Networks*, 2<sup>nd</sup> Edition, Prentice Hall.

Thurwachter, C. N., 2002, *Wireless Networking*, Prentice Hall.

Zheng, P., Peterson, L. L., Davie, B. S. and Farrel, A., 2009, *Wireless Networking Complete*, Morgan Kaufmann.

**Journals:**

IEEE Transactions on Mobile Computing

IEEE Pervasive Computing

IEEE Transactions on Wireless Communications

IEEE Journal on Selected Areas in Communications

ACM Wireless Networks

ACM Mobile Networks and Applications