

Subject Description Form

Subject Code	COMP5327
Subject Title	Wireless Networking and Mobile Computing
Credit Value	3
Level	5
Pre-requisite / Co-requisite/ Exclusion	Nil (but some knowledge in internet infrastructure and protocols is preferable)
Objectives	<p>After completing this subject, students will learn about:</p> <ul style="list-style-type: none"> • enabling technologies for wireless networking and mobile computing • wireless networking standards • mobile computing applications
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p><i>Professional/academic knowledge and skills</i></p> <ol style="list-style-type: none"> a. show in-depth understanding of advanced wireless networking technologies and their applications in a variety of real-world applications; b. work with apply coherent and state-of-the-art knowledge on related protocols and technologies, design innovative solutions and critically assess their performance; c. categorize and summarize the trends and development of wireless networking and mobile computing. <p><i>Attributes for all-roundedness</i></p> <ol style="list-style-type: none"> d. demonstrate team work spirit in group projects, communicate appropriately with a range of audiences in presentation and summarize results in technical reports .
Subject Synopsis/ Indicative Syllabus	<ul style="list-style-type: none"> • Cellular Networks – Frequency Reuse, Access Protocols, Location Management, Handoff Management, 2G/3G/4G Cellular Network Standards • Wireless Local Area Networks – Overview of IEEE 802.11 Standard, Access Protocols, Mobility Management • Personal Area Networks / Bluetooth – Overview of Bluetooth Standard, Piconet and Scatternet, Frequency Hopping, Baseband Protocol, Link Manager Protocol, Logical Link Control and Adaption Protocol • Mobile/Wireless Security – Cellular Security, WiFi Security, Bluetooth Security • Location-aware Computing – GPS, Indoor Positioning Techniques, Location-aware Applications

	<ul style="list-style-type: none"> • Mobile Computing Applications – Mobile Apps, Case Studies • Other Selected Topics (e.g., Mobile IP, RFID, Sensors) 																																		
Teaching/Learning Methodology	<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>																																		
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1"> <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				
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Reading List and References	<p>Books:</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>, 2nd Edition, O'Reilly & 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>, 2nd 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>, IEEE Press.</p> <p>Perkins, C. E., 1998, <i>Mobile IP: Design Principles and Practices</i>, Addison-Wesley.</p> <p>Sadeh, N. M., 2002, <i>M-Commerce: Technologies, Services, and Business Models</i>, John Wiley and Sons.</p> <p>Sauter, M., 2017, <i>From GSM to LTE-Advanced Pro and 5G: An Introduction to Mobile Networks and Mobile Broadband</i>, 3rd Edition, Wiley.</p> <p>Smith, C. and Collins, D., 2014, <i>Wireless Networks</i>, 3rd Edition, McGraw-Hill Education.</p> <p>Stallings, W., 2005, <i>Wireless Communications and Networks</i>, 2nd Edition, Prentice Hall.</p> <p>Thurwachter, C. N., 2002, <i>Wireless Networking</i>, Prentice Hall.</p> <p>Zheng, P., Peterson, L. L., Davie, B. S. and Farrel, A., 2009, <i>Wireless Networking Complete</i>, Morgan Kaufmann.</p> <p>Journals:</p> <p>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</p>
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