

Subject Description Form

Subject Code	COMP4435
Subject Title	Dependable Computing
Credit Value	3
Pre-requisite / Co-requisite/ Exclusion	NIL
Objectives	<p>The objectives of this subject are to:</p> <ol style="list-style-type: none"> 1. introduce to students the concept of dependability as a measure of a system's availability, reliability and maintainability 2. equip students with knowledge on the measures and techniques to improve system dependability 3. discuss how dependable computing techniques can be applied in practical scenarios
Intended Subject Learning Outcomes	<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"> (1) understand the elements of dependability and why it matters; (2) understand how dependability of a system can be assessed or measured; (3) apply various techniques to improve the dependability of a software system; <p><u>Attributes for All-Roundness</u></p> <ol style="list-style-type: none"> (4) an ability to explain the attributes, threats and means of an information system to a wide range of audience
Contribution of the Subject to the Attainment of the Programme Outcomes	<p>Programme Outcome 3: This subject contributes to the knowledge of dependability and fault tolerance necessary to the discipline of information security.</p> <p>Programme Outcome 4: This subject allows the students to assess the dependability of an information system and to design measures to ensure its reliability</p> <p>Programme Outcome 9: To analyse the impact of system dependability on individuals, organizations and society</p>
Subject Synopsis/ Indicative Syllabus	<ol style="list-style-type: none"> 1. Overview of Dependability Notion of dependability, its definition, attributes (availability, reliability, safety, security, maintainability) and measurements as well as related concepts such as errors, faults and hazard 2. Fault Avoidance and Fault Elimination Role of specification (the Z language), programming standards, inspection and testing. 3. Fault Tolerance Fault detection, masking, containment, location, reconfiguration and recovery, redundancy 4. Secure Issues in E-commerce E-commerce security breaches, including Internet Fraud and Espionage, Secure Electronic Transactions (SET), the iKP protocols 5. Advanced Topics Dependability evaluation techniques and tools: fault trees, Markov chains; fault tolerance in distributed systems; Information Redundancy; Risk Analysis, Disaster Recovery, Emergency Management; Security Policies, Procedures, Frameworks

Teaching/Learning Methodology	<p>During the lectures, students will come across the common concepts and theories. Those concepts and theories would be explained with reference to case studies.</p> <p>In the tutorials, students will be given scenarios related to the area of information security where these concepts are relevant.</p>																																									
Assessment Methods in Alignment with Intended Subject Learning Outcomes	<table border="1" data-bbox="501 331 1382 716"> <thead> <tr> <th data-bbox="501 331 786 555" rowspan="2">Specific Assessment Methods/Tasks</th> <th data-bbox="786 331 970 555" rowspan="2">% Weighting</th> <th colspan="7" data-bbox="970 331 1382 488">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="970 488 1027 555">1</th> <th data-bbox="1027 488 1085 555">2</th> <th data-bbox="1085 488 1142 555">3</th> <th data-bbox="1142 488 1200 555">4</th> <th data-bbox="1200 488 1257 555"></th> <th data-bbox="1257 488 1315 555"></th> <th data-bbox="1315 488 1382 555"></th> </tr> </thead> <tbody> <tr> <td data-bbox="501 555 786 651">Continuous Assessment</td> <td data-bbox="786 555 970 651">55</td> <td data-bbox="970 555 1027 651">✓</td> <td data-bbox="1027 555 1085 651">✓</td> <td data-bbox="1085 555 1142 651">✓</td> <td data-bbox="1142 555 1200 651">✓</td> <td data-bbox="1200 555 1257 651"></td> <td data-bbox="1257 555 1315 651"></td> <td data-bbox="1315 555 1382 651"></td> </tr> <tr> <td data-bbox="501 651 786 716">Final Examination</td> <td data-bbox="786 651 970 716">45</td> <td data-bbox="970 651 1027 716">✓</td> <td data-bbox="1027 651 1085 716">✓</td> <td data-bbox="1085 651 1142 716">✓</td> <td data-bbox="1142 651 1200 716">✓</td> <td data-bbox="1200 651 1257 716"></td> <td data-bbox="1257 651 1315 716"></td> <td data-bbox="1315 651 1382 716"></td> </tr> </tbody> </table> <p>Types of assessments included assignments, test and examination. Assignments are designed to reinforce the concepts and theories learned in the lecture and tutorial, by solving bigger problems. Test and examination are used to assess independent problem solving and critical thinking skills.</p>								Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)							1	2	3	4				Continuous Assessment	55	✓	✓	✓	✓				Final Examination	45	✓	✓	✓	✓			
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Continuous Assessment	55	✓	✓	✓	✓																																					
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Student Study Effort Expected	Class contact (time-tabled):																																									
	Lecture							39 hours																																		
	Other student study effort:																																									
	Assignments, self-study, text and exam preparation							66 hours																																		
	Total student study effort:							105 hours																																		
Reading List and References	<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Fundamentals of Dependable Computing for Software Engineers, John Knight, Chapman and Hall/CRC, ISBN: 1439862559 2. Software Reliability Engineering: More Reliable Software Faster and Cheaper, John D. Musa, Authorhouse, ISBN: 1418493872 																																									