

Subject Description Form

Subject Code	COMP3335
Subject Title	Database Security
Credit Value	3
Level	3
Pre-requisite	COMP2411 Database Systems or equivalent introductory database subject
Co-requisite/ Exclusion	Nil
Objectives	<ol style="list-style-type: none"> 1. Introduce to students about security threats with respect to database applications 2. Equip students with knowledge of security measures and understanding on the concepts in protecting data 3. Equip students with skills to design and implement secure database applications with respect to the security requirements
Intended Subject Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p><u>Category A: Professional/academic knowledge and skills</u></p> <ol style="list-style-type: none"> 1. Identify security threats in database systems 2. Understand the concepts and security mechanisms in the protection of data 3. Design and implement secure database systems <p><u>Category B: Attributes for all-roundedness</u></p> <ol style="list-style-type: none"> 4. Develop skills in problem solving 5. Solve complex problems in team and function effectively in a team environment to achieve a common goal
Subject Synopsis/ Indicative Syllabus	<p>Syllabus:</p> <ol style="list-style-type: none"> 1. <u>Overview of Database Concepts</u> Common database technologies and database application architectures, including ER modelling and existing relational database management systems such as MySQL and Oracle; advanced database technologies, including object-oriented databases and distributed databases. 2. <u>Introduction to Database Security</u> Threats to databases; commonly accepted security goals (integrity, availability and confidentiality); kinds of security control measures. 3. <u>Access Control</u> Database authorization, including discretionary security mechanisms and mandatory security mechanisms. 4. <u>Inference Control</u> Nature of statistical database and the inference control mechanism to prevent detailed confidential information. 5. <u>Flow Control and Data Encryption</u> Flow control as a measure to prevent information from reaching unauthorized users; Data encryption as a measure to protect sensitive data. 6. <u>Overview of Advanced Topics</u> Including security threats with respect to SQL injection attacks, virtual private databases and database auditing.

Teaching/Learning Methodology	<p>During the lectures, students will come across the common concepts and theories in database security issues. Those concepts and theories would be explained with reference to real database systems such as Oracle and MySQL.</p> <p>Hands-on exercises in tutorial/laboratory will be included to allow students to explore and analyse practical problems and topics. Group project to solve database security problems will help students to integrate and apply what they have learnt.</p>																																					
Assessment Methods in Alignment with Intended Subject Learning Outcomes	<table border="1" data-bbox="491 472 1412 853"> <thead> <tr> <th data-bbox="491 472 786 629" rowspan="2">Specific Assessment Methods/Tasks</th> <th data-bbox="786 472 954 629" rowspan="2">% Weighting</th> <th colspan="5" data-bbox="954 472 1412 584">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="954 584 1043 629">1</th> <th data-bbox="1043 584 1133 629">2</th> <th data-bbox="1133 584 1222 629">3</th> <th data-bbox="1222 584 1311 629">4</th> <th data-bbox="1311 584 1412 629">5</th> </tr> </thead> <tbody> <tr> <td data-bbox="491 629 786 725">1. Continuous Assessment</td> <td data-bbox="786 629 954 725">55%</td> <td data-bbox="954 629 1043 725">✓</td> <td data-bbox="1043 629 1133 725">✓</td> <td data-bbox="1133 629 1222 725">✓</td> <td data-bbox="1222 629 1311 725">✓</td> <td data-bbox="1311 629 1412 725">✓</td> </tr> <tr> <td data-bbox="491 725 786 790">2. Examination</td> <td data-bbox="786 725 954 790">45%</td> <td data-bbox="954 725 1043 790">✓</td> <td data-bbox="1043 725 1133 790">✓</td> <td data-bbox="1133 725 1222 790">✓</td> <td data-bbox="1222 725 1311 790">✓</td> <td data-bbox="1311 725 1412 790"></td> </tr> <tr> <td data-bbox="491 790 786 853">Total</td> <td data-bbox="786 790 954 853">100%</td> <td colspan="5" data-bbox="954 790 1412 853"></td> </tr> </tbody> </table> <p>Types of assessments include assignments, project, test and examination. Assignments are designed to reinforce the concepts and mechanisms learned in the lecture and laboratory, by solving bigger problems. Project is used to develop students' analytic and problem solving skills by developing a practical database security policy. 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	5	1. Continuous Assessment	55%	✓	✓	✓	✓	✓	2. Examination	45%	✓	✓	✓	✓		Total	100%					
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Student Study Effort Expected	Class contact:																																					
<ul style="list-style-type: none"> • Lecture 			39 Hours																																			
Other student study effort:																																						
<ul style="list-style-type: none"> • Assignments, project, self-study, text and exam preparation 			66 Hours																																			
	Total student study effort:		105 Hours																																			
Reading List and References	Reference Books: <ol style="list-style-type: none"> 1. Hassan A. Afyouni, <i>Database Security and Auditing: Protecting Data Integrity and Accessibility</i>, United States: Cengage Learning, 2006. 2. Alfred Basta, Melissa Zgola, <i>Database Security</i>, United States: Cengage Learning, 2011. 																																					
Last Updated	July 2016																																					
Prepared by	Dr Allen Au (COMP Department)																																					