Subject Description Form

Subject Code	EIE3112
Subject Title	Database System
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	**To introduce:** 1. database design, development, and programming 2. advanced database queries and database security 3. data warehousing and data mining
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Database design, development, and programming 2. Advanced database queries and database security. 3. Data warehousing and data mining Category B: Attributes for all-roundedness 4. Communicate effectively
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Database Design and Development 1.1 DBMS systems; Client-server architecture; Database architectures and the web 1.2 SQL: data manipulation; data definition; 1.3 DB Development: DB applications and views; 1.4 Advanced SQL: SQL programming language; stored procedures; functions; triggers; cursors; exception handling 1.5 ER Modelling: ER diagrams; Transforming ER diagrams to relations 1.6 Normalization: Data redundancy and update anomalies; functional dependencies; normalization processes; normal forms 2. Managing Database Environments 2.1 Database Security: Database security best practices; SQL injection; Preventing SQL injection 3. Data Warehouse and Data Mining 3.1 Architectures of data warehouse; applications of data warehouse; data warehouse tools and technologies 3.2 Data warehouse queries; OLTP versus OLAP; 3.3 Data-mining processes; Data representation; 3.4 Classification, regression, and cluster Analysis **Laboratory Experiments** Lab 1: Database Implementation and SQL Lab 2: Advanced SQL Lab 3: Data Mining and Data Analysis

<table>
<tr><td>Teaching/Learning Methodology</td><td>Lectures: Fundamental principles and key concepts of the subject are delivered to students.

Tutorials: Students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed. Students will be given programming exercises and use database development tools to design database.

Laboratory Sessions: Students will do some programming exercises to enhance their understanding on database design and development.</td></tr>
<tr><td>Alignment of Assessment and Intended Subject Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Continuous Assessment (Total: 50%)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Short quizzes</td><td>5%</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>• Assignment</td><td>5%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Test</td><td>20%</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>• Laboratory</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Short quizzes: These can measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.

Test & Examination: End-of-chapter-type problems are used to evaluate the students' ability in applying concepts and skills learnt in the classroom; students need to think critically and to learn independently in order to come up with an appropriate design.

Laboratory: Each student is required to produce a report; the accuracy and presentation of the report will be assessed.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture/Tutorial</td><td>30 Hours</td></tr>
<tr><td>• Laboratory/Practice Classes</td><td>9 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
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</td></tr>
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Reading List and References	1. Thomas Connolly and Carolyn Begg, *Database Systems: A Practical Approach to Design, Implementation, and Management*, 6/E, Pearson, 2015. 2. Mark L. Gillenson, *Fundamentals of database management systems, Wiley*, 2nd ed., Wiley, 2012. 3. I.H. Witten, *Data Mining: Practical Machine Learning Tools and Techniques*, 3rd ed., Morgan Kaufmann, 2011
Last Updated	September 2016
Prepared by	Dr Pauli Lai