

## Subject Description Form

<b>Subject Code</b>	COMP 2411
<b>Subject Title</b>	Database Systems
<b>Credit Value</b>	3
<b>Level</b>	2
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Pre-requisite: COMP 1011
<b>Objectives</b>	The objectives of this subject are to: 1. design, develop, implement, and administrate a database system of considerable complexity;  2. possess enough background to evaluate various DBMSs of different data models and make the appropriate selection for an organization.
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to:  <i>Professional/academic knowledge and skills</i> (a) acquire a good understanding of the architecture and functioning of database management systems, as well as to be able to use the associated tools and techniques; (b) understand and apply the principles and practices of good database design and analysis; (c) recognize the direction of database technology and their implication so as to manage and plan database system developments.  <i>Attributes for all-roundedness</i> (d) appreciate development of database technologies for lifelong learning, e.g., web databases; (e) build up on team spirit, presentation and technical writing skills.
<b>Subject Synopsis/ Indicative Syllabus</b>	1. Basic concepts of database system - Database and its applications; DBMS design objectives and its components; ANSI/SPARC three-level system architecture; data independence.  2. Database design - Entity-relationship model; functional dependencies; normalization.  3. Relational data model - Relational structure; relational languages: relational algebra, relational calculus, SQL; relational constraints: entity constraints, referential integrity constraints and foreign keys.  4. File structures and physical database design - File organization; indexing and hashing.

	<p>5. Application design and query processing - Relational view definition and management; equivalence of query expressions, estimation of query-processing cost, join strategies; embedded SQL.</p> <p>6. Implementation issues - Buffer management; transaction processing; concurrency control; crash and recovery; security and integrity.</p>																																	
<p><b>Teaching/Learning Methodology</b></p>	<p>This subject emphasizes the technical/practical aspects of database design and development. It is intended to equip the student with knowledge and practical experience on the real-life/industrial database application development.</p> <p>The lectures will be used to deliver course material that will be practiced/reinforced during the labs and tutorials.</p>																																	
<p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b></p>	<table border="1"> <thead> <tr> <th rowspan="2">Specific Assessment Methods/Tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>Assignments, Tests &amp; Projects</td> <td>55</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Final Examination</td> <td>45</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>100</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed					a	b	c	d	e	Assignments, Tests & Projects	55	✓	✓	✓	✓	✓	Final Examination	45	✓	✓	✓			Total	100					
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<p><b>Reading list and references</b></p>	<ol style="list-style-type: none"> <li>1. Michael Manning. Database Design, Application Development, &amp; Administration, 3rd (international) edition, McGraw-Hill, 2007.</li> <li>2. David Kroenke. Database Processing: Fundamentals, Design and Implementation, 11th edition, Prentice Hall, 2010.</li> <li>3. A Silberschatz, H.F. Korth, S. Sudarshan. Database System Concepts 6th Edition. McGraw Hill, 2011.</li> <li>4. Hector Garcia-Molina, Jeffrey D. Ullman &amp; Jennifer Widom. Database System Implementation, Prentice Hall, 3<sup>rd</sup> edition, 2008.</li> <li>5. C. J. Date. An Introduction to Database Systems, Addison-Wesley Longman, 2004.</li> </ol>																																	