Description: Database Systems

<table>
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<th>Subject</th>
<th>Cat-nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
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<td>CSC</td>
<td>3400</td>
<td>62269</td>
<td>1, 2007</td>
<td>EXT</td>
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Academic group: FOSCI
Academic org: FOS003
Student contribution band: 2
ASCED code: 020303

STAFFING
Examiner: Stijn Dekeyser
Moderator: Michael de Raadt

OTHER REQUISITES
Recommended Pre-requisite: MAT1101 and CSC2401 and CSC2407 and CSC2408

RATIONALE
The key component of information systems is database management systems. These are widely used in scientific, business, government, and industrial organisations. It is important for a computing professional to understand the basic concepts of database systems, to be proficient in database query languages, and to know the design principles of database systems.

SYNOPSIS
This course covers the fundamental issues of the relational model, relational languages, database design and query processing. It starts with a structured overview of database systems, their history and application. The relational model is then covered in detail. Relational languages such as the relational algebra and calculus are discussed before introducing the SQL language. Then we cover the Entity-Relationship model and discuss how ER diagrams are translated to the relational model. Topics on database design principles in this course further include functional dependencies. Students will gain a good understanding of database design theory and principles and be able to develop database systems and application programs on a DBMS.

OBJECTIVES
On completion of this course the student should be able to:

1. demonstrate an in-depth understanding of the relational model; (assignment 1, exam)
2. correctly construct relational algebra and relational calculus expressions; (assignment 1, exam)
3. reformulate an English language query statement in the relational algebra, relational calculus, and SQL formalisms; (assignment 1, assignment 2, exam)
4. create, modify, query, and update a relational database using SQL; (tutorials, exam, assignment 2)
5. design an Entity-Relationship diagram on the basis of a description of database requirements; (assignment 3, exam)
6. translate an ER-diagram into a relational schema; (assignment 3, exam)
7. normalise relations using functional dependencies. (assignment 3, exam)

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tr>
<td>1. The relational model</td>
<td>10.00</td>
</tr>
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<td>2. The relational algebra and calculus</td>
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<td>3. The SQL language</td>
<td>20.00</td>
</tr>
<tr>
<td>4. The Entity-Relationship model</td>
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<tr>
<td>5. Relational database design</td>
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**TEXT and MATERIALS required to be PURCHASED or ACCESSED**

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at http://bookshop.usq.edu.au click 'Semester', then enter your 'Course Code' (no spaces).

A relational database management system (DBMS) such as: MySQL, latest version, http://www.mysql.com free download; PostgreSQL, latest version, http://postgreSQL free download. Students may choose any of these two or any other to practise their knowledge of SQL. Manuals for these systems are included in the downloads.

Connolly, T & Begg, C 2005, *Database systems, a practical approach to design, implementation and management*, 4th edn, Addison-Wesley, Harlow.  

**REFERENCE MATERIALS**

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Assessment</td>
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<tr>
<td>Examinations</td>
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<tr>
<td>Private Study</td>
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ASSESSMENT DETAILS

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<tr>
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<th>Wtg(%)</th>
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<td>ASSIGNMENT 2</td>
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<td>ASSIGNMENT 3</td>
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NOTES

1. Examination dates will be available during the semester. Please refer to the examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

1. Attendance requirements:
   There are no attendance requirements for this course. However, it is the students’ responsibility to study all material provided to them or required to be accessed by them (including course Web pages) to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2. Requirements for students to complete each assessment item satisfactorily:
   To satisfactorily complete an assessment item a student must achieve at least 50% of the marks or a grade of at least C-.
   Students do not have to satisfactorily complete each assessment item to be awarded a passing grade in this course. Refer to Statement 4 below for the requirements to receive a passing grade in this course.

3. Penalties for late submission of required work:
   If students submit assignments after the due date without prior approval then a penalty of 10% of the total marks available for the assignment will apply for each working day late.

4. Requirements for student to be awarded a passing grade in the course:
   To be assured of receiving a passing grade a student must achieve at least 30% in all of the weighted assessment items, achieve at least 40% in the examination and at least 50% of the total weighted marks available for the course.

5. Method used to combine assessment results to attain final grade:
   The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative assessment items in the course.

6. Examination information:
   In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.

7. Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL http://www.usq.edu.au/corporateservices/calendar/part5.htm or in the current USQ Handbook.

ASSESSMENT NOTES

9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.

10 Students may be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to the USQ within 24 hours of receipt of a request to do so.

11 Assignments should be submitted electronically, through the course website.

OTHER REQUIREMENTS

1 Students will require access to e-mail and internet access to USQConnect and the Course Web site, and are expected to check these resources frequently.

2 Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items.