Division of Information and Communication Sciences

Department of Computing

COMP326 Information Systems Development
2000 - Semester 1
(2 streams - day & evening)

http://www.comp.mq.edu.au/courses/comp326

Lectures:

A/Prof. Leszek Maciaszek (Lecturer in Charge)

room: E6A 319
email: leszek@ics.mq.edu.au
phone: 9850-9519

A/Prof. C.N.G. (Kit) Dampney

room: E6A 320
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Dr Abhaya Nayak

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Practicals (tutorials/workshops):

Ian Cowell email: icowell@ics.mq.edu.au
C.N.G. (Kit) Dampney email: cdampney@ics.mq.edu.au
Leszek Maciaszek email: leszek@ics.mq.edu.au
Abhaya Nayak email: abhaya@ics.mq.edu.au

Time and place:

Lectures (day):
Monday (1 hour) 10.05 E7B T5
Tuesday (1 hour) 10.05 E7B T3
Wednesday (1 hour) 10.05 E7B T4

Lectures (evening):
Monday (3 hours) 18.05 E7B T3
Tutorials (day):
- Wednesday (2 hours) 14.05 E7B 100
- Thursday (2 hours) 10.05 E6A 109
- Friday (2 hours) 9.05 E6A 133
- Friday (2 hours) 11.05 E7B 100

Tutorials (evening):
- Wednesday (2 hours) 17.05 E6A 108
- Wednesday (2 hours) 19.05 E6A 108

Unit objectives:
The purpose of this unit is to enable students to accomplish two major objectives:

1) A sound, rigorous understanding of information systems analysis and design for the implementation of client/server database applications.

2) An understanding of advanced database topics, including support for objects, transaction management, distributed system architectures and new database applications (such as data warehouses and multimedia databases).

The technology emphasis in this unit is on client/server distributed databases. Analysis and design part of the unit targets implementation platforms based on client/server software systems. The part of the unit that concentrates on advanced database topics explains implementation underpinnings of large distributed systems.

Reading list:

Indispensable reading:
- Lecture & Tutorial Notes on COMP326 Web site: 
  http://www.comp.mq.edu.au/courses/comp326/

Essential reading (advanced database lectures and tutorials):

Very important reading (analysis and design tutorials and individual practice):

Recommended reference (analysis and design lectures and tutorials):

Assessment:

Assignments and tests (35%): 
- Test 1 8%
- Test 2 8%
- Assignment 1 10%
- Assignment 2 9% (Asg. 2 consists of two parts: 2a and 2b)

Tests will be set as multiple-choice questions, whenever possible. Assignments need to be submitted in the COMP326 assignment boxes in building E6A ground floor. Late assignments will be discounted by 1 mark per day after the deadline.
Assignments should be presented in a folder or bound document. The cover page must show your first name and surname (surname to be underlined or capitalised), student number, unit number, unit name and assignment number clearly labelled on the outside.

**Final examination (60%)**

Students must perform satisfactorily in the final examination as well as in the combined assignments/mid-test total in order to pass.

**Software**

The unit involves the use of an Object/Relational Database Management System (ORACLE®) running on the UNIX operating system. It also involves the use of a CASE (Computer-Aided Software Engineering) tool that supports UML (Unified Modeling Language) (Rational Rose®).

**Withdrawal**

The withdrawal dates for the first semester are:

*on or before 31 March:*

- **NE** - not effectively enrolled, no record on academic transcript, no HECS charge

*after 31 March:*

- **FW** - failure recorded, HECS paid
- **W** - withdrawal without penalty because of “unavoidable disruption”, W printed on the record, HECS paid

**Liaison meetings**

The Computing Department organises regular 100-level, 200-level and 300-level year liaison meetings in both semesters for students enrolled in Computing units. These meetings are formally constituted, in that each unit has a number (usually 2 or 3) of student representatives who attend the appropriate year liaison committee meetings and represent the class as a whole at these meetings.

The purpose of the committee is to discuss any problems or issues relating to 300-level units and students. These can range from the simple-to-fix (eg the tutorial room is too small and we have to stand), to the more general issues (eg why can’t we learn whatever) and to more serious concerns (eg we can’t understand what the lecturer is saying).

The liaison meetings are convened and chaired by a member of the academic staff, who is responsible for student liaison for a particular year. There is a formal agenda and minutes are posted soon after a meeting for all students to read. These meetings are also attended by the academic staff currently involved in teaching at that level, a member of the technical support services, and frequently by the Head of Department and/or the Director of Teaching.

Meetings are normally convened, on a regular basis, by the member of academic staff, responsible for coordinating student liaison for that particular year. Students may, at any time, request a meeting if they feel strongly enough that there is an issue that merits the convening of a meeting. To request a meeting, contact your student representatives, who will pass the request on to the appropriate year liaison co-ordinator. It is assumed always that the first point of contact for resolving any issues/problems is the unit co-ordinator and the unit teaching staff.

If you feel that, for any reason, your concerns are not being taken seriously by the teaching staff, your student representatives or the year liaison co-ordinator, or there is a conflict of interest involved, you should consult the Head of Department (Associate Professor Mike Johnson) or the Director of Teaching (Professor Ray Offen). In the end, you are always entitled to have an impartial and sympathetic hearing.

Please make sure that you know who your class representatives are for this unit, and make a point of talking to them regularly. For this unit, your 300-level liaison co-ordinator is ???. Details regarding the 300-level Computing Liaison Committee and your unit representatives may be found at:

http://www.comp.mq.edu.au/courses/300-liaison
**Code of Behaviour**

The Code of Behaviour sets out our expectations concerning the use of the computing facilities. The University Council has approved a set of rules governing access to and the use of the University’s computing facilities. Students who break them may be suspended from using the systems and, in serious cases, may be referred to the Discipline Committee of the University.

The rules set out the rights and, conversely, the responsibilities of all users of the facilities. In particular, they are based on the principle that the files in an account are the owner’s personal property and should be treated as such. Unauthorised use of someone else’s account is a serious offence, whether it be copying their files (stealing), or changing them (damage), or merely gaining access to them (trespass). You will be expected to observe these rules and also any other regulations posted in the Department’s laboratories.

**Special considerations:**

If illness or misadventure makes it impossible for you to sit the final examination, or interfere significantly with your performance in the exam, you are permitted to request *special consideration*. Your request must be in writing to the Registrar’s Office (see the University Calendar for more details). As a result of your request, you may be required to sit a *special examination*, and you should note the following:

- If granted *special examination*, your performance in the *final examination* (if you sat one) will not be considered in assessing your final grade.
- You must ensure that you are readily available to be contacted, and must hold yourself available to sit for the special examination at short notice on the date and time we set.
- If you elect to be away from your contact address during the week of the special examination, and so cannot be contacted, or are unavailable to sit for the examination, your grade for this unit will be reported as *FA*.
- The purpose of any special examination is to resolve the temporary difficulty caused by your illness or misadventure, and is not to give you an advantage over other students by allowing you extra time to study. We will, therefore, hold the special examination as soon as possible, and in determining your grade, we will take into account the possibility of extra study time available to you.
- No matter what your circumstances, your grade in COMP326 will not be improved unless you sit special examination and perform in it accordingly.
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<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Tutorials/Practicals</th>
<th>Asg/Tests</th>
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<tbody>
<tr>
<td>1</td>
<td>Feb 28 (Leszek &amp; Abhaya)</td>
<td>Overview of COMP326 content. Explanation of fundamental concepts.</td>
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<td>Indexing and hashing (review from COMP224). Query processing</td>
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<td>[Silberschatz (Ch. 11, 12)]</td>
<td>Review and exercise questions in indexing and query cost estimation. [Oracle8 on-line documentation]</td>
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<td>2</td>
<td>Mar 6 (Abhaya)</td>
<td>Transaction management for concurrency.</td>
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<td>[Silberschatz (Ch. 13, 14)]</td>
<td>Review and exercise questions in transaction management for concurrency. [Silberschatz (Ch. 14)]</td>
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<td>3</td>
<td>Mar 13 (Abhaya)</td>
<td>Transaction management for recovery.</td>
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<td>[Silberschatz (Ch. 13, 15)]</td>
<td>Review and exercise questions in concurrency control in Oracle8. [Oracle8 on-line documentation]</td>
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<td>4</td>
<td>Mar 20 (Abhaya)</td>
<td>Distributed databases.</td>
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<td>[Silberschatz (Ch. 16, 18)]</td>
<td>Review and exercise questions in transaction management for recovery. [Silberschatz (Ch. 15); Oracle8 on-line documentation]</td>
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<td>5</td>
<td>Mar 27 (Abhaya)</td>
<td>Advanced transaction processing.</td>
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<td>[Silberschatz (Ch. 20)]</td>
<td>Review and exercise questions in distributed databases. [Silberschatz (Ch. 18)]</td>
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<td>6</td>
<td>Apr 3 (Abhaya)</td>
<td>New database applications.</td>
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<td>[Silberschatz (Ch. 21)]</td>
<td>Review and exercise questions in advanced transaction processing. [Silberschatz (Ch. 20)]</td>
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<td>Easter Break</td>
<td>Test 1 Asg. 1 out</td>
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<td>7</td>
<td>May 1 (Kit)</td>
<td>System structure - Class diagrams - notation, semantics, stereotypes used in client/server architecture. Problem domain analysis - Entity-Relationship approach to class discovery. Class relationships. Class Inheritance. Ref: Silberschatz et al Ch 2 [Rumbaugh (Ch. 1, 2, 3, 4 &amp; Ch. 13 &quot;Encyclopedia of Terms&quot;)</td>
<td>(Tutorial and Practical) Exercises in class modeling [Quatrani (Ch. 1, 2, 4, 6 (except packages), 8]</td>
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<td>8</td>
<td>May 8 (Kit)</td>
<td>User requirements analysis - Use Cases. Model-View Controller approach to class discovery. The Business Object [Rumbaugh (Ch. 5, 6, 7, 8 &amp; Ch. 13 &quot;Encyclopedia of Terms&quot;)</td>
<td>Review of Exercise from week 7. Exercises in behaviour and state change modeling of &quot;business objects&quot;. [Quatrani (Ch. 3, 7, 9]</td>
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<tr>
<td>Date</td>
<td>Lecture Topics</td>
<td>Review/Exercise Questions</td>
<td>Assignments Due</td>
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<td>9 May 15 (Kit)</td>
<td>Object behaviour modeling, State transition modeling (state diagrams), GUI function and specification of user interaction. with form [Rumbaugh (Ch. 13 &quot;Encyclopedia of Terms&quot;)].</td>
<td>Review of week 8. Review of Asg 2a Prac and Tute Lab exercises in &quot;GUI Painting&quot; [Visual Basic on-line documentation].</td>
<td>Asg 2a in</td>
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<td>10 May 22 (Kit)</td>
<td>System behaviour modeling. Object Interaction diagrams. Specifying public interfaces to system components (class operations).</td>
<td>Review of Asg 2b. Prac and Tute Lab exercises in object interaction diagrams. [Quatrani (Ch. 3, 5, 6, 7, 8, 9)].</td>
<td>Asg. 2b in</td>
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<td>11 May 29 (Leszek)</td>
<td>Architectural design of client/server applications (components, nodes, packages, architectural tiers, coupling and cohesion, solution strategies, design patterns). [Rumbaugh (Ch. 9, 10 &amp; Ch. 13 &quot;Encyclopedia of Terms&quot;).</td>
<td>Review and exercise questions to illustrate &quot;good&quot; architectural design. [Quatrani (Ch. 10, 11, 12)].</td>
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<td>12 June 5 (Leszek)</td>
<td>Object-relational databases. [Silberschatz (Ch. 9)].</td>
<td>Exercises in mapping UML specifications of &quot;business objects&quot; to relational and object-relational database. [Silberschatz (Ch. 9)].</td>
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<td>13 June 13 (Leszek)</td>
<td>Advanced issues in database design (views, temporary tables, procedures, triggers, collections, references). Issues in client/server program design (user authorisation, data entry validation, business transactions, round-trip engineering). [Silberschatz (Ch. 19)].</td>
<td>Review and exercise questions in special topics with regard to client/server system design. [Silberschatz (Ch. 19)].</td>
<td>Test 2</td>
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