Description: Object-Oriented Design with UML and Java

<table>
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<tr>
<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
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<td>CSC</td>
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<td>24453</td>
<td>2, 2003</td>
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Academic Group: FOSCI
Academic Org: FOS003
HECS Band: 2
ASCED Code: 020305

STAFFING
Examiner: Hua Wang
Moderator: Yan Li

OTHER-REQUISITES
Recommended Pre-requisite: CSC2402 and CSC2407 and CSC4403

RATIONALE
As object-oriented techniques rapidly become the standard for systems development throughout the computing industry, development methodologies based on earlier structured programming techniques have been found to be inadequate. A number of modelling techniques that support the object-orient analysis and development paradigms have been published, and have been adopted by object developers world wide. Students will be expected to gain a solid understanding of object-oriented modelling requirements and the principles in analysis, design and programming, and be able to appraise the suitability of methodologies and techniques for particular problem domains.

SYNOPSIS
This course introduces object-oriented methods for analysing a problem domain and creating an implementation independent formal representation of the system requirements, from which an object-oriented design of the system is then constructed. Issues involved in the process of transforming an OO analysis of a system into an OO design and implementation are studied in the context of a large software project in an application domain and implementation platform of the student's own choosing. Students will be provided with the knowledge and skill in the latest concepts in object-oriented analysis and object-oriented design, coupled with the most comprehensive OO modelling language and notation - Unified Modelling language (UML), plus implementation with the Java programming language. Students will be given the opportunity to study the methodologies for applying these
fundamental concepts through project work to develop a variety of distributed application systems.

**OBJECTIVES**

On successful completion of this course students will be able to:

- demonstrate an understanding of several variations on the terminology, fundamental concepts and models for object-oriented software systems.
- demonstrate the ability to apply the steps in OOA/OOD using a variety of approaches.
- understand the elements of the Unified Modelling Language (UML) and how each element maps to a corresponding step or concept in the OO software development process.
- understand how the Java language supports and has influenced OO and specific elements of modelling languages, as well as steps in the OO software development process.
- take an OO software development process through iterative refinement steps using OOA/OOD methods, modelling languages and prototyping in Java.
- apply the OOA/OOD/OOP techniques for building real-world software systems.

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Introduction to OO Modelling and Vocabulary of Object Technology</td>
<td>10.00</td>
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<tr>
<td>2. An application-driven, iterative-incremental, and architecture-oriented life style for software development</td>
<td>15.00</td>
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<tr>
<td>3. Introduction to Unified Modelling Languages</td>
<td>15.00</td>
</tr>
<tr>
<td>4. Suitability of the above OOA/D techniques and methodologies to various problem domains</td>
<td>15.00</td>
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<tr>
<td>5. Applying an OO methodology and techniques to a particular domain using UML</td>
<td>35.00</td>
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<tr>
<td>6. Techniques for implementing from an OO design using Java language and arranging to access database using the Java Database Connectivity</td>
<td>10.00</td>
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**TEXT and MATERIALS required to be PURCHASED or ACCESSED:**

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

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>
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<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tr>
<td>Directed Study</td>
<td>30</td>
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<td>Examinations</td>
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<td>Private Study</td>
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</tr>
<tr>
<td>Project Work</td>
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ASSESSMENT DETAILS

<table>
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<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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<tr>
<td>PROJECT PLAN</td>
<td>5.00</td>
<td>5.00</td>
<td>Y</td>
<td>08 Aug 2003</td>
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<tr>
<td>ANALYSIS PHASE</td>
<td>15.00</td>
<td>15.00</td>
<td>Y</td>
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<td>PROJECT DESIGN PHASE</td>
<td>20.00</td>
<td>20.00</td>
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<td>10 Oct 2003</td>
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<tr>
<td>PROJECT SOFTWARE &amp; DOCUMENTATION</td>
<td>25.00</td>
<td>25.00</td>
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<td>07 Nov 2003</td>
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<td>2 HOUR CLOSED EXAMINATION</td>
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<td>35.00</td>
<td>Y</td>
<td>END S2 (see note )</td>
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NOTES:

- 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 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 complete each of the assessment items satisfactorily, students must obtain at
least 50% of the marks available for each assessment item. To complete the
examination satisfactorily, students must obtain at least 50% of the marks available
for the examination.

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 submit all of the
summative assessment items, achieve at least 50% in the examination and at least
50% of the available weighted marks for the summative assessment items.

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/SECARIAT/calendar/Part5/ or in the printed version of 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. If requested, students will be required to provide
a copy of assignments submitted for assessment purposes. Such copies should be
despached to USQ within 24 hours of receipt of a request being made.

OTHER REQUIREMENTS

1 Students will be required to have access to a CASE tool for UML and Java software
(available from http://java.sun.com/products/).

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