Description: Object-Oriented Programming in C++

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC</td>
<td>2402</td>
<td>20417</td>
<td>1, 2003</td>
<td>ONC</td>
<td>1.00</td>
<td>WIBAY</td>
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</table>

Academic Group: FOSCI
Academic Org: FOS003
HECS Band: 2
ASCED Code: 020103

STAFFING
Examiner: Ron House
Moderator: Penny Baillie

PRE-REQUISITES
Pre-requisite: CSC1401

RATIONALE
Object-oriented programming and other advanced techniques are rapidly becoming the standard systems developing methodologies throughout the computing industry. Therefore future information technology specialists will require a solid grounding in object-oriented programming and design.

SYNOPSIS
This course extends the student's design and programming skills to cover object-oriented programming methods, which are rapidly becoming the standard systems development methodology throughout the computing industry. Students will be expected to gain a solid understanding of object-oriented principles in analysis, design and programming, and to develop skills using C++. Topics will typically include: review or study of the principles of object-oriented development (e.g. abstraction, inheritance, polymorphism and dynamic binding), problem decomposition, method design, planning for re-use, and object-oriented programming. Advanced programming techniques applicable to C++ are also covered.

OBJECTIVES
On successful completion of this course students will:

- have gained a good understanding of the additional features of C++ compared with C,
- be able to employ existing C++ class libraries in the development of C++ programs,
• be able to design new C++ classes and systems of classes to encapsulate data structures and representations of objects,
• be familiar with principles of object-oriented analysis and high-level design in order to identify suitable classes for implementation,
• understand object-oriented principles including inheritance, friends, the class life cycle, class implementation and testing, and designing for reuse;
• Use the C++ STL at an intermediate level.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General principles: Objects, classes, abstraction, inheritance,</td>
<td>30.00</td>
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<tr>
<td>polymorphism, encapsulation, application and class life cycle.</td>
<td></td>
</tr>
<tr>
<td>2. General principles: Identifying classes, class design, is-a and has-a,</td>
<td>30.00</td>
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<tr>
<td>reusability design by contract.</td>
<td></td>
</tr>
<tr>
<td>3. C++: Classes, virtual base classes, friends, constructors and destructors,</td>
<td>40.00</td>
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<tr>
<td>overloading, operator functions, virtual functions, templates, C++ stream,</td>
<td></td>
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<tr>
<td>STL.</td>
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</table>

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.

The student must have access to a standard C++ compiler. The only supported compilers are the Linux g++ compiler and the DOS/Windows DJGPP compiler.

Students who do not purchase the CD Set should purchase the printed study materials from the Bookshop.

Department of Mathematics and Computing CDROM SET 1, S1 2003 (available from the Bookshop). This CD set contains course materials, Windows and Linux Software for this and various other courses. For more information about the CD sets and their use, please refer to http://www.sci.usq.edu.au/cdrom.

Introductory Book 2003, Course CSC2402 Object-Oriented Programming in C++, USQ Distance Education Centre, Toowoomba.


Selected Readings 2003, Course CSC2402 Object-Oriented Programming in C++, USQ Distance Education Centre, Toowoomba.

Study Book 2003, Course CSC2402 Object-Oriented Programming in C++, USQ Distance Education Centre, Toowoomba.
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>
</tr>
</thead>
<tbody>
<tr>
<td>Examinations</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory or Practical Classes</td>
<td>26</td>
</tr>
<tr>
<td>Lectures</td>
<td>26</td>
</tr>
<tr>
<td>Private Study</td>
<td>107</td>
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</table>

ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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</thead>
<tbody>
<tr>
<td>TUTORIAL &amp; PRACTICAL EXERCISE</td>
<td>10.00</td>
<td>10.00</td>
<td>Y</td>
<td>04 Mar 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(see note)</td>
</tr>
<tr>
<td>ASSIGNMENT 1</td>
<td>10.00</td>
<td>10.00</td>
<td>Y</td>
<td>04 Apr 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>10.00</td>
<td>10.00</td>
<td>Y</td>
<td>16 May 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 3</td>
<td>10.00</td>
<td>10.00</td>
<td>Y</td>
<td>13 Jun 2003</td>
</tr>
<tr>
<td>3 HOUR CLOSED EXAMINATION</td>
<td>60.00</td>
<td>60.00</td>
<td>Y</td>
<td>END S1</td>
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<td></td>
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<td>(see note)</td>
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NOTES:

. Refer to the Examiner for information about Assignment dates.
. Examination dates will be available during the semester. Please refer to the examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
   It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and 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.

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 gained by the student 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 a passing grade, students must gain at least 50% of the marks for the examination and 50% of the total marks for the four non-exam assessment items. There is no requirement that students must pass every non-exam assessment.

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

6 Examination information:
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.

10 Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.

11 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.

12 The Faculty will NOT accept submission of assignments by facsimile.

13 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non directed personal study.

14 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time, may apply to defer an assessment in a course. Such a request must be
accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination); IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

OTHER REQUIREMENTS

1. Students will require access to an appropriate computer either via the student's own arrangements or a USQ study centre. Ideally, students should have access to email and the Internet.