Description: Software Engineering Design Principles

<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>
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<td>41211</td>
<td>1, 2005</td>
<td>ONC</td>
<td>1.00</td>
<td>Toowoomba</td>
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Academic group: FOENS
Academic org: FOES04
Student contribution band: 2
ASCED code: 031305

STAFFING
Examiner: Hong Zhou
Moderator: John Leis

OTHER-REQUISITES
Recommended prior or concurrent study: CIS3001 and CSC2407

RATIONALE
Software-based systems play a pivotal role in society. As a consequence of both the increasing reliance on software systems and the increasing complexity of software development processes, there is a need to formally address the underlying processes of software design, development, deployment and maintenance in an educational context. The software engineering graduate is expected to have a sound grasp of software design methodologies so as to be able to understand the role of the working software engineer in both small and large-scale software development teams. Since programming languages and development tools evolve, this course addresses issues of software system specification, design, testing, and maintenance in a manner which is largely independent of language issues and operating systems.

SYNOPSIS
In this course the student will gain a broad understanding of all aspects of the software development process. The topics covered include end-user requirements analysis and specification, the software lifecycle, design and specification techniques, component testing and integration testing, and maintenance and cost issues, together with an introduction to software project management. The selection of software development paradigms, design for re-use, test coverage, coding and documentation conventions, and revision management tools are examined. Current and emerging thinking in software development is addressed using professional literature and industry case studies. The course is enhanced by the coverage of other aspects such as ethical considerations and team psychology.

OBJECTIVES
On completion of this course, students should be able to:
1. analyse, design and test computer software using object paradigm;
2. read and write Requirements Analysis Document using UML models;
3. road and develop System Design Document and Object Design Document;
4. explain several typical software architectures and design patterns;
5. design and execute test cases using black box and white box techniques;
6. describe the activities involved in software rationale management, project management
   and quality management;
7. explain the role of Computer-Aided Software Engineering (CASE) tools;
8. describe the design principles of user interface design;
9. define the common security and robustness issues in software development;
10. analyse relevant literature in software engineering;
11. describe the role and function of professional bodies associated with software
    engineering.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>Requirement Elicitation and Analysis</td>
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<tr>
<td>System and Object Design</td>
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<td>Software Testing</td>
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<td>Software Management</td>
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<td>User Interface Design, CASE and Security</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).

ELE3401 Software Engineering Design Principles lecture notes, available online:
http://www.usq.edu.au/users/hzhou/
(ELE3401 Software Engineering Design Principles lecture notes, available online:
http://www.usq.edu.au/users/hzhou/)

Bruegge, B & Dutoit, A 2004, *Object-oriented software engineering using UML, Pattern and
Java*, 2nd edn, Prentice Hall,

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.

Boston.

STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>52.00</td>
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<tr>
<td>Examinations</td>
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<tr>
<td>Lectures</td>
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<tr>
<td>Private Study</td>
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<td>Tutorials</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>Due date</th>
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<tr>
<td>ASSIGNMENT 1</td>
<td>200.00</td>
<td>20.00</td>
<td>15 Apr 2005</td>
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<tr>
<td>ASSIGNMENT 2</td>
<td>200.00</td>
<td>20.00</td>
<td>03 Jun 2005</td>
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<tr>
<td>3 HOUR CLOSED EXAMINATION</td>
<td>600.00</td>
<td>60.00</td>
<td>END S1</td>
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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:
   (i) To complete each of the assignments satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) for each assignment. (ii) To complete the examination satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) 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 a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by satisfactorily completing all summative assessment items (the examination and assignments), as stated in 2 above.

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 (or grades) 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

1 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.

2 Students must retain a copy of each item submitted for assessment. This must be despatched to USQ within 24 hours if required by the Examiner.

3 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.

4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.

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

6 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

7 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 one of the temporary grades: IM (Incomplete - Make up), IS (Incomplete - Supplementary Examination) or ISM (Incomplete -Supplementary Examination and Make up). A temporary 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.

8 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 e-mail and internet access to USQConnect for this course.