



The University of Southern Queensland

## Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.  
Please consult the web for updates that may occur during the year.

### Description: Software Engineering Design Principles

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
ELE	3401	86693	1, 2009	EXT	1.00	Toowoomba

<b>Academic group:</b>	FOENS
<b>Academic org:</b>	FOES04
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	031305

### STAFFING

Examiner: Hong Zhou  
Moderator: Wei Xiang

### 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

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. On completion of this course, students should be able to:

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

## TOPICS

	Description	Weighting (%)
1.	Requirement Elicitation and Analysis	25.00
2.	System and Object Design	30.00
3.	Software Testing	25.00
4.	Software Management	10.00
5.	User Interface Design, CASE and Security	10.00

## 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: <http://www.usq.edu.au/users/hzhou/>).

Bruegge, B & Dutoit, A 2004, *Object-oriented software engineering using UML, Patterns and Java*, 2nd edn, Prentice Hall, Upper Saddle River, NJ.

## 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.

Pressman, RS 2005, *Software engineering: a practitioner's approach*, 6th edn, McGraw-Hill, Boston.

Sommerville, I 2007, *Software engineering*, 8th edn, Addison-Wesley, New York.

Stevens, P & Pooley, R 2006, *Using UML - software engineering with objects and components*, 2nd edn, Addison-Wesley, Harlow.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assignments	52.00
Directed Study	52.00
Examinations	2.00
Private Study	49.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	200.00	20.00	23 Apr 2009
ASSIGNMENT 2	200.00	20.00	05 Jun 2009
2 HOUR CLOSED EXAMINATION	600.00	60.00	END S1 (see note 1)

### NOTES

1. Student Administration will advise students of the dates of their examinations during the semester.

## 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 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 extenuating circumstances then a penalty of 5% of the assigned mark may apply for each working day late up to a maximum of ten working days at which time a mark of zero can be recorded for that assignment.
- 4 Requirements for student to be awarded a passing grade in the course:  
To be assured of receiving a passing grade in a course a student must obtain at least 50% of the total weighted marks 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 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.
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