SENG2130: Systems Analysis and Design
Callaghan
Semester 1 - 2024

OVERVIEW

Course Description	This course examines the development of information systems and their software components. It focuses on the need for development methodologies that support the emerging need for flexible, interactive and evolutionary construction.
Academic Progress Requirements	Nil
Requisites	This course has similarities to INFT2009. If you have successfully completed INFT2009 you cannot enrol in this course.
Assumed Knowledge	SENG1110 Object Oriented Programming OR INFT1004 Introduction to Programming
Contact Hours	**Callaghan**
	Computer Lab
	Face to Face On Campus
	2 hour(s) per week(s) for 12 week(s) starting Week 2
	Lecture
	Face to Face On Campus
	2 hour(s) per week(s) for 13 week(s) starting Week 1
Unit Weighting	10
Workload	Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

CONTACTS

Course Coordinator	**Callaghan** Mr Eugene Lutton Eugene.Lutton@newcastle.edu.au Consultation: Please Email for Consultation Email Subject header: SENG2130 / Callaghan / Reason for email
Teaching Staff	Other teaching staff will be advised on the course Canvas site.
School Office	**School of Information and Physical Sciences** SR233, Social Sciences Building Callaghan CESE-SIPS-Admin@newcastle.edu.au +61 2 4921 5513 9am-5pm (Mon-Fri)

SYLLABUS

Course Content

1. Overview of Software Development Life-Cycle models.
2. Modelling approaches and modelling languages such as UML in software development.
3. Requirement elicitation and system design.
4. Implementation strategies.
5. Introduction to the later phases of software development.
6. Personal, professional and social responsibilities in ICT and how they need to be considered in all phases of software development.

Course Learning Outcomes

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

1. Produce design documents that demonstrate their understanding of the role of each major software development phase.

2. Produce and evaluate a software design.

3. Describe a software design using UML diagrams.

4. Produce a strategy plan for system deployment and ongoing maintenance.

5. Discuss the professional and social responsibilities of software engineers.

Course Materials

Other Resources:

- SEBoK: Guide to the Systems Engineering Body of Knowledge (SEBoK). https://www.sebokwiki.org/wiki/Guide_to_the_Systems_Engineering_Body_of_Knowledge_(SEBoK)

Recommended Reading:

- Satzinger, Jackson and Burd. (2016) Systems Analysis and Design in a Changing World, Cengage Learning. Can be accessed via UoN library (E-Book)
Bruegge, Dutoit. (2010) Object-Oriented Software Engineering using UML, Patterns, and Java, Prentice Hall

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:
-

Course Assessment Requirements:
- Assessment 2 - Formal Exam: Pass requirement 40% - Must obtain 40% in this assessment item to pass the course.

Compulsory Placement and WHS Requirements:
-

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	Introduction	This is an indicative Course Schedule. It may slightly change as required. Review Lecture questions	
2	4 Mar	Requirements Elicitation: Introduction to UML and Use Case diagram	Computer Labs Start Review lab and lecture questions Team formation	
3	11 Mar	Requirements Elicitation: Use Case description and Activity diagram	Review lab and lecture questions	Quiz 1 by Sunday 11.:59 pm
4	18 Mar	UML diagrams – Class and Object diagrams	Review lab and lecture questions	
5	25 Mar	UML diagrams – Sequence & Collaboration diagrams	Review lab and lecture questions	Quiz 2 by Sunday 11.:59 pm
6	1 Apr	Analysis Object Models	Review lab and lecture questions	
7	8 Apr	System Design	Review lab and lecture questions	Quiz 3 by Sunday 11.:59 pm Assessment 1 due by Friday 11.59pm
		Mid-Semester Recess		
		Mid-Semester Recess		
8	29 Apr	Object Design	Review lab and lecture questions	
9	6 May	Interface Design	Review lab and lecture questions	Quiz 4 by Sunday 11.:59 pm
10	13 May	System Deployment Approaches and Management	Review lab and lecture questions	
11	20 May	Risk Management, Testing and Ethics	Review lab and lecture questions	Quiz 5 by Sunday 11.:59 pm
12	27 May	Risk Management, Testing and Ethics	Review lab and lecture questions	Assessment 4 due by Friday 11.59pm
13	3 Jun	Course review	Exam Preparation	
		Examination Period		
		Examination Period		

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Group Project 1	Friday 11.59pm (Week7)	Group	20%	1, 2, 3, 5
2	Formal Exam*	Formal Exam Period	Individual	40%	2, 3, 4, 5
3	Online Quiz	Weeks: 3,5,7,9,11 By Sunday 11.59pm for each of the above weeks	Individual	10%	3, 4, 5
4	Group Project 2	Friday 11.59pm (Week 12)	Group	30%	1, 2, 3, 4, 5

* This assessment has a compulsory requirement.

Late Submissions   The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Group Project 1

Assessment Type   Written Assignment

Purpose   The group project stimulates real world application development and will give students some experiences of large system development. The project will also enhance students communication skills and ability to work in a team. Team management processes will be assisted by using templates provided.

Description   The project has two milestones. The first milestone of the project focuses on the requirement modelling of a software system along with some system analysis and rudimentary design. Findings will be presented using appropriate UML diagrams in a report format and include items such as team meeting and management documentation.

Weighting   20%

Due Date   Friday 11.59pm (Week7)

Submission Method   Online
Via Canvas

Assessment Criteria   Refer to Assessment specifications on Canvas

Return Method   Not Returned

Feedback Provided   Online - Once all assessments are submitted and graded.

Opportunity to Reattempt   Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Formal Exam

Assessment Type   Formal Examination

Purpose   The final formal examination is designed to test the individual student's knowledge of the course material and their ability to describe, analyse problems given in the formal exam

Description   2 hour formal exam

Weighting   40%

Compulsory Requirements   Pass requirement 40% - Must obtain 40% in this assessment item to pass the course..

Due Date   Formal Exam Period

Submission Method   Formal Exam
Formal Exam

Assessment Criteria

Return Method   Not Returned

Feedback Provided   No Feedback

Opportunity to Reattempt   Students WILL be given the opportunity to reattempt this assessment.

Assessment 3 - Online Quiz

Assessment Type   Quiz

Description	Online quizzes
Weighting	10%
Length	10 questions in 20 minutes
Due Date	Weeks: 3,5,7,9,11
	By Sunday 11.59pm for each of the above weeks
Submission Method	Online
Assessment Criteria	A student's overall mark for the quizzes will be based on the student's best 4 of the 5 quizzes. For this reason, we will not accept adverse circumstances request for individual quizzes.
Return Method	Not Returned
Feedback Provided	Online - Marks will be available shortly after each quiz.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 4 - Group Project 2

Assessment Type	Written Assignment
Purpose	The group project stimulates real world application development and will give students some experiences of large system development. The project will also improve students communication skills and ability to work in a team. Team management processes will be assisted by using templates provided.
Description	In the second milestone, students will finalise the design of the software system and findings will be presented using appropriate UML diagrams in a report format. This milestone will include items such as interface prototypes, testing protocols, deployment plan, team meetings and management documentation.
Weighting	30%
Due Date	Friday 11.59pm (Week 12)
Submission Method	Online
	Via Canvas
Assessment Criteria	Refer to Assessment specifications on Canvas
Return Method	Not Returned
Feedback Provided	Online - Once all assessments are submitted and graded.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Attendance   Attendance/participation will be recorded in the following components:

- Computer Lab (Method of recording: Class Roll)

Communication Methods	Communication methods used in this course include: - Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site. - Email: Students will receive communications via their student email account. - Face to Face: Communication will be provided via face to face meetings or supervision.
Course Evaluation	Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement. As a result of student feedback, the following changes have been made to this offering of the course: - Sample examples of system models
Oral Interviews (Vivas)	As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure. In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the Student Conduct Rule.
Academic Misconduct	All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to https://policies.newcastle.edu.au/document/view-current.php?id=35.
Adverse Circumstances	The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where: 1. the assessment item is a major assessment item; or 2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system; 3. you are requesting a change of placement; or 4. the course has a compulsory attendance requirement. Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at: https://policies.newcastle.edu.au/document/view-current.php?id=236
Important Policy Information	The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures that support a safe and respectful environment at the University.

Graduate Profile Statements

The following table illustrates how this course contributes towards building the skills students will need to work in their profession.

Level of capability
- Level 1 indicates an introduction to a topic at a university level
- Levels 2 and 3 indicate progressive reinforcement of that topic
- Level 4 indicates skills commensurate with a graduate – entry to professional practice

Program Outcomes for B Engineering (Honours) (Software) (AQF Level 8 Descriptors)	Taught	Practised	Assessed	Level of capability
1. Comprehensive, theory-based understanding of engineering fundamentals and/or the underpinning natural and physical sciences as applicable to the engineering discipline				
2. Conceptual understanding of the mathematics, numerical analysis, statistics and computer and information sciences which underpin the engineering discipline				
3. In-depth understanding of specialist bodies of knowledge within the engineering discipline	X	X	X	2
4. Discernment of knowledge development and research directions within the engineering discipline				
5. Knowledge of contextual factors impacting the engineering discipline	X	X		2
6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline	X	X		2
7. Application of established engineering methods to complex engineering problem solving	X	X	X	2
8. Fluent application of engineering techniques, tools and resources	X	X	X	2
9. Application of systematic engineering synthesis and design processes	X	X	X	2
10. Application of systematic approaches to the conduct and management of engineering projects				
11. Ethical conduct and professional accountability	X			2
12. Effective oral and written communication in professional and lay domains	X	X	X	2
13. Creative, innovative and pro-active demeanour	X	X		2
14. Professional use and management of information	X	X		2
15. Orderly management of self, and professional conduct	X	X		2
16. Effective team membership and team leadership	X	X	X	2

Program Outcomes for B Information Technology (AQF Level 7 Descriptors)	Taught	Practised	Assessed	Level of capability
1. Demonstrate a comprehensive understanding of information technology with an emphasis on interconnected applications, information management, and user requirements for ethical professional practice.	X	X	X	2
2. Apply critical reasoning and systems thinking to understand and support the operation and constraints of contemporary enterprises and their dynamic environment.	X	X	X	2
3. Work both independently and collaboratively to locate, manage and organise information and resources and will apply evidence-based approaches to create, modify and maintain designs and design solutions.	X	X	X	2
4. Apply problem solving skills, project management skills, and technical expertise to analyse, interpret, evaluate and generate solutions to complex technical and organisational problems.	X	X	X	2
5. Demonstrate professional judgement and responsibility by clearly and persuasively communicating principles, practices, and standards of	X	X	X	2

information technology to specialist and non-specialist audiences.				

Program Outcomes for B Computer Science (AQF Level 7 Descriptors)	Taught	Practised	Assessed	Level of capability
1. Knowledge of basic science and computer science fundamentals	X	X	X	2
2. In depth technical competence in the discipline of computer science	X	X	X	2
3. An ability to carry out problem analysis, requirements capture, problem formulation and integrated software development for the solution of a problem	X	X	X	2
4. Capacity to continue developing relevant knowledge, skills and expertise in computer science throughout their careers	X	X	X	2
5. An ability to communicate effectively with other Computer Scientists, Software Engineers, other professional disciplines, managers and the community generally	X	X	X	2
6. Ability to undertake and co-ordinate large computer science projects and to identify problems, their formulation and solution	X	X	X	2
7. Ability to function effectively as an individual, a team member in multidisciplinary and multicultural teams and as leader/manager with capacity to assist and encourage those under their direction	X	X	X	2
8. Understanding of social, cultural, global and business opportunities of the professional computer scientist; understanding the need for and principles of sustainability and adaptability	X	X		2
9. Understanding of professional and ethical responsibilities and a commitment to them	X	X	X	2
10. Understanding of entrepreneurship; need of and process of innovation, as well as the need of and capacity for lifelong learning	X	X	X	2