INFO2110: SYSTEMS ANALYSIS AND MODELLING

Semester 2, 2017 | 6 Credit Points | Mode: Normal-Day
Coordinator(s): Vera Chung

WARNING: This unit is an archived version! See Overview tab for delivered versions.

1. INTRODUCTION

This unit provides a comprehensive introduction to the analysis of complex systems. Key topics are the determination and expression of system requirements (both functional and non-functional), and the representation of structural and behavioural models of the system in UML notations. Students will be expected to evaluate requirements documents and models as well as producing them. This unit covers essential topics from the ACM/IEEE SE2004 curriculum, especially from MAA Software Modelling and Analysis.

2. LEARNING OUTCOMES

Learning outcomes are the key abilities and knowledge that will be assessed in this unit. See assessment summary table below for details of which outcomes are assessed where. Outcomes are listed according to the course goals that they support.

Design (Level 2)

1. An awareness of the tasks involved in identifying alternative system solutions and assessing their feasibility

Engineering/IT Specialisation (Level 3)

2. Experience of requirements discovery based on a substantial realistic context, eg through joint requirements planning, carrying out or watching interviews, questionnaires; Ability to work with requirements documents, to identify aspects of requirements including functional, performance and usability conditions
3. Experience of data modelling based on a substantial realistic context; An awareness of the tasks involved when working with conceptual data model documents, along with the ability to create, interpret and evaluate UML class structure diagrams. [Working with documents includes answering English questions about their content, identifying inconsistencies or problematic aspects, and converting between representations.]
4. Experience of process modelling based on a substantial realistic context; An awareness of the tasks involved when working with process model documents, along with the ability to create, interpret and evaluate UML message sequence diagrams, collaboration diagrams, activity diagrams and statechart diagrams. [Working with documents includes answering English questions about their content, identifying inconsistencies or problematic aspects, and converting between representations.]
5. Ability to relate different diagrams (e.g. to identify inconsistencies between them)

Maths/Science Methods and Tools (Level 3)

6. Knowledge of set and relation foundations for class diagrams; knowledge of state-transition foundations for activity and statechart diagrams.

Communication (Level 2)

7. Ability to produce clear well-constructed technical documents and diagrams. Ability to produce and deliver an oral presentation.

Professional Conduct (Level 2)

8. An understanding of the stages in the process of developing an information system, and the relationship to the organisational context (especially the role of systems analysts interacting with other stakeholders); understanding of the way the process uses documents such as requirements descriptions and analysis models.

Project and Team Skills (Level 2)

9. An awareness of risk issues, and of methods of dealing with them, including cost-benefit analyses, project planning and management. Ability to work with project planning documents including Gantt charts and detailed Work Breakdown Structures

For further details of course goals related to these learning outcomes, see online unit outline at http://cusp.eng.usyd.edu.au/students/view-unit-page/alpha/INFO2110 .

3. ASSESSMENT TASKS

ASSESSMENT SUMMARY

Assessment name	Team-based?	Weight	Due	Outcomes Assessed
Assignment 1: System requirements	Yes	9%	Week 5	1, 2, 3, 4, 7, 8, 9
Assignment 2: System modelling	Yes	12%	Week 11	2, 3, 4, 5, 7, 8
Quiz-1	No	3%	Week 6	1, 2, 3, 8, 9
Quiz-2	No	3%	Week 8	3, 4, 5, 6
Quiz-3	No	3%	Week 10	3, 4, 5, 6
Final Exam	No	70%	Exam Period	1, 2, 3, 4, 5, 6, 8, 9

ASSESSMENT DESCRIPTION

Assignment 1: System Requirements (in teams). Elicit and document system requirements; deliver/explain these in oral presentation.

Assignment 2: System Modelling. Following on from the previous assignment the teams will assemble descriptions of the system using appropriate notations. Design a simple prototype using HTML, JQuery or other prototyping tools.

Quiz 1,2,3 : System Modelling using UML notations.

Final Exam: Written Examination. Covering all aspects of the unit. Duration two hours.

ASSESSMENT GRADING

Final grades in this unit are awarded at levels of HD for High Distinction, DI (previously D) for Distinction, CR for Credit, PS (previously P) for Pass and FA (previously F) for Fail as defined by University of Sydney Assessment Policy. Details of the Assessment Policy are available on the Policies website at http://sydney.edu.au/policies . Standards for grades in individual assessment tasks and the summative method for obtaining a final mark in the unit will be set out in a marking guide supplied by the unit coordinator.
It is a policy of the School of Information Technologies that in order to pass this unit, a student must achieve at least 40% in the written examination as well as in the other components of assessment together. A student must also achieve an overall final mark of 50 or more. Any student not meeting these requirements may be given a maximum final mark of no more than 45 regardless of their average.

4. ATTRIBUTES DEVELOPED

Attributes listed here represent the course goals designated for this unit. The list below describes how these attributes are developed through practice in the unit. See Learning Outcomes and Assessment sections above for details of how these attributes are assessed.

Attribute	Method
Design (Level 2)	Problem investigation and analysis. Identifying and evaluating alternative solutions.
Engineering/IT Specialisation (Level 3)	Requirements Capture, and conceptual Data and Process modelling - essential skills in the ICT disciplines.
Maths/Science Methods and Tools (Level 3)	Knowledge of the abstract (mathematically-based) models used to capture state-transition systems, sets and relationships, etc.
Information Seeking (Level 2)	Identifying information needs. Gathering and evaluating information from varied sources.
Communication (Level 2)	Producing clear well-constructed technical documents and diagrams. Undertaking an oral presentation.
Professional Conduct (Level 2)	Appreciation of the organisational context of information systems development. Awareness of professional responsibilities for systems analysts.
Project and Team Skills (Level 2)	Working in project teams with clearly differentiated roles and responsibilities. Awareness of planning issues and methods. Ability to work with project planning methods and documents.

For further details of course goals and professional attribute standards, see the online version of this outline at http://cusp.eng.usyd.edu.au/students/view-unit-page/alpha/INFO2110 .

5. STUDY COMMITMENT

Tutorial and Laboratory: Students will work in groups to practice systems analysis activities, and discuss how the concepts can be applied.

Independent Study: Students are expected to work independently and to make effective use of a range of resources including the library, the Internet and relevant on-line help facilities. They should expect to spend a minimum of 12 hours per week on this unit including four hours of scheduled class times.

Activity	Hours per Week	Sessions per Week	Weeks per Semester
Lecture	2.00	1	13
Tutorial	1.00	1	12
Laboratory	1.00	1	12
Independent Study	8.00		13

Standard unit of study workload at this university should be from 1.5 to 2 hours per credit point which means 9-12 hours for a normal 6 credit point unit of study. For units that are based on research or practical experience, hours may vary. For lecture and tutorial timetable, see University timetable site at: web.timetable.usyd.edu.au/calendar.jsp

6. TEACHING STAFF AND CONTACT DETAILS

COORDINATOR(S)

Name	Room	Phone	Email	Contact note
Dr Chung, Vera		612-90369109	vera.chung@sydney.edu.au	

LECTURERS

Name	Room	Phone	Email	Contact note
Dr Chung, Vera		612-90369109	vera.chung@sydney.edu.au	

7. RESOURCES

PRESCRIBED TEXTBOOK(S)

Dennis, A., Wixom, B.H., and Tegarden, D., *System Analysis & Design with UML Version 2* (5th). John Wiley & Sons, 2015.

COURSE WEBSITE(S)

https://elearning.sydney.edu.au

NOTE ON RESOURCES

For other references and most recent information on this course, lecture slides, instructions for tutorials and lab tasks, exercises etc. make a visit at least once per week to the course's web page using Blackboard at http://elearning.sydney.edu.au

8. ENROLMENT REQUIREMENTS

ASSUMED KNOWLEDGE

Experience with a data model as in INFO1003 or INFO1103 or INFS1000

PREREQUISITES

None.

9. POLICIES

ACADEMIC HONESTY

While the University is aware that the vast majority of students and staff act ethically and honestly, it is opposed to and will not tolerate academic dishonesty or plagiarism and will treat all allegations of dishonesty seriously.

All students are expected to be familiar and act in compliance with the relevant University policies, procedures and codes, which include:

- *Academic Honesty in Coursework Policy 2015*
- *Academic Honesty Procedures 2016*
- *Code of Conduct for Students*
- *Research Code of Conduct 2013* (for honours and postgraduate dissertation units)

They can be accessed via the University"s Policy Register: http://sydney.edu.au/policies (enter "Academic Honesty" in the search field).

Students should never use document-sharing sites and should be extremely wary of using online "tutor" services. Further information on academic honesty and the resources available to all students can be found on the Academic Integrity page of the University website: http://sydney.edu.au/elearning/student/EI/index.shtml

Academic Dishonesty and Plagiarism

Academic dishonesty involves seeking unfair academic advantage or helping another student to do so.

You may be found to have engaged in academic dishonesty if you:

- Resubmit (or "recycle") work that you have already submitted for assessment in the same unit or in a different unit or previous attempt;
- Use assignment answers hosted on the internet, including those uploaded to document sharing websites by other students.
- Have someone else complete part or all of an assignment for you, or do this for another student.
- Except for legitimate group work purposes, providing assignment questions and answers to other students directly or through social media platforms or document ("notes") sharing websites, including essays and written reports.
- Engage in examination misconduct, including using cheat notes or unapproved electronic devices (e.g., smartphones), copying from other students, discussing an exam with another person while it is in progress, or removing confidential examination papers from the examination venue.
- Engage in dishonest plagiarism.

Plagiarism means presenting another person's work as if it is your own without properly or adequately referencing the original source of the work.

Plagiarism is using someone else's ideas, words, formulas, methods, evidence, programming code, images, artworks, or musical creations without proper acknowledgement. If you use someone's actual words you must use quotation marks as well as an appropriate reference. If you use someone's ideas, formulas, methods, evidence, tables or images you must use a reference. You must not present someone's artistic work, musical creation, programming code or any other form of intellectual property as your own. If referring to any of these, you must always present them as the work of their creator and reference in an appropriate way.

Plagiarism is always unacceptable, regardless of whether it is done intentionally or not. It is considered dishonest if done knowingly, with intent to deceive or if a reasonable person can see that the assignment contains more work copied from other sources than the student's original work. The University understands that not all plagiarism is dishonest and provides students with opportunities to improve their academic writing, including their understanding of scholarly citation and referencing practices.

USE OF SIMILARITY DETECTION SOFTWARE

All written assignments submitted in this unit of study will be submitted to the similarity detecting software program known as **Turnitin**. Turnitin searches for matches between text in your written assessment task and text sourced from the Internet, published works and assignments that have previously been submitted to Turnitin for analysis.

There will always be some degree of text-matching when using Turnitin. Text-matching may occur in use of direct quotations, technical terms and phrases, or the listing of bibliographic material. This does not mean you will automatically be accused of academic dishonesty or plagiarism, although Turnitin reports may be used as evidence in academic dishonesty and plagiarism decision-making processes.

Computer programming assignments may also be checked by specialist code similarity detection software. The Faculty of Engineering & IT currently uses the MOSS similarity detection engine (see http://theory.stanford.edu/~aiken/moss/) . These programs work in a similar way to TII in that they check for similarity against a database of previously submitted assignments and code available on the internet, but they have added functionality to detect cases of similarity of holistic code structure in cases such as global search and replace of variable names, reordering of lines, changing of comment lines, and the use of white space.

IMPORTANT: School policy relating to Academic Dishonesty and Plagiarism.

In assessing a piece of submitted work, the School of IT may reproduce it entirely, may provide a copy to another member of faculty, and/or to an external plagiarism checking service or in-house computer program and may also maintain a copy of the assignment for future checking purposes and/or allow an external service to do so.

Other policies

See the policies page of the faculty website at http://sydney.edu.au/engineering/student-policies/ for information regarding university policies and local provisions and procedures within the Faculty of Engineering and Information Technologies.

10. WEEKLY SCHEDULE

Note that the "Weeks" referred to in this Schedule are those of the official university semester calendar https://web.timetable.usyd.edu.au/calendar.jsp

Week	Topics/Activities
Week 1	Course Introduction; Overview of SDLC.
	Reading: Dennis Ch 1
Week 2	Requirements: Functional.
	Reading: Dennis Ch 3.
Week 3	Requirements: non-Functional
	Reading: Dennis Ch 3
Week 4	Project plan and its use in project management.
	Reading: Dennis Ch 2.
Week 5	Human Computer Interaction layer Design.
	Guest lecture from CSIRO-Data61
	Reading: Dennis Ch 10.
	Assessment Due: Assignment 1: System requirements
Week 6	Physical and System Architecture Design
	Reading: Dennis Ch 11.
	Assessment Due: Quiz-1
Week 7	Structural models of the domain (I): Introduction to class and object diagrams.
	Reading: Dennis Ch 5.
Week 8	Structural Models of the domain (II): Class and object diagrams. Using CRC cards in analysis.
	Reading: Dennis Ch 5,8.
	Assessment Due: Quiz-2
Week 9	Introduction to HTML
	Modelling of Rule Based System.
Week 10	Behavioral Models in Analysis; Interaction diagrams;
	Reading: Dennis Ch 6.
	Assessment Due: Quiz-3
Week 11	Behavioural models (interaction diagram, state diagram)
	Validation of models
	Reading:Dennis Ch6, Ch7
	Assessment Due: Assignment 2: System modelling
Week 12	Construction (Testing and documentation)
	Ethics and careers in systems analysis.
	Reading: Dennis Ch12
Week 13	Review
Exam Period	Assessment Due: Final Exam