UNIVERSITY OF CANBERRA

Systems Analysis and Modelling

Unit code and version	11486.1
Unit offering option	207300
Study level	Level 1 - Undergraduate Introductory Unit
Credit points	3
Faculty	Faculty of Science and Technology
Discipline	Academic Program Area - Technology
Unit offering details	Semester 2, 2022 , ON-CAMPUS , UC - Canberra, Bruce
Unit convener name and contact details	Unit Convener/Lecturer: Dr Luke Nguyen-Hoan Phone: +61 2 6206 8527 Email: Luke.Nguyen-Hoan@canberra.edu.au Unit Moderator: Rosetta Romano
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Academic content

Unit description

This unit applies the theory of information systems analysis and modelling to the specification of IT-supported organisational systems. It integrates the students' knowledge of database design and human-computer interaction with functional and situational requirements to produce coherent systems specification. It describes and demonstrates the tools and techniques used to formally describe what an information system is to do, and the methods used by information systems analysts to construct these descriptions. The process of domain modelling is considered from vague systems conceptualisation using soft systems techniques through a process of refinement and verification to a Unified Modelling Language (UML) based specification for the technical system and a design for the organisational system. It examines the role of analysis and modelling in various systems development life cycles. This unit may be co-taught with 6677 Systems Analysis and Modelling G.

Learning outcomes

On successful completion of this unit, students should be able to:

1. Analyse IT-supported processes and hence derive appropriate system models;
2. Use abstraction as a modelling device;
3. Use international standard systems description paradigms and languages;
4. Explain the role of analysis within various systems development life cycles;
5. Understand the role of systems models in the synthesis of systems; and
6. Apply tools for managing analysis processes.

Graduate attributes

1. UC graduates are professional
    - communicate effectively
    - display initiative and drive, and use their organisation skills to plan and manage their workload
    - employ up-to-date and relevant knowledge and skills
    - take pride in their professional and personal integrity
    - use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems
    - work collaboratively as part of a team, negotiate, and resolve conflict
2. UC graduates are global citizens
    - communicate effectively in diverse cultural and social settings
    - make creative use of technology in their learning and professional lives
3. UC graduates are lifelong learners
    - adapt to complexity, ambiguity and change by being flexible and keen to engage with new ideas
    - be self-aware
    - evaluate and adopt new technology
    - reflect on their own practice, updating and adapting their knowledge and skills for continual professional and academic development

Skills development

As students of the University of Canberra, you will develop your critical thinking skills, your ability to solve complex problems, your ability to work with others, your confidence to learn independently, your written communication skills, your spoken communication skills and a number of work-related knowledge and skills.

Prerequisites

None.

Corequisites

None.

Accreditation

ACS Accreditation

This unit is part of courses accredited by the Australian Computer Society (ACS)

Skills Framework for the Information Age (SFIA) v8

This unit aligns with the following SFIA professional skills:

- Business situation analysis BUSA
- Systems design DESN
- Data modelling and design DTAN
- Requirements definition and management REQM

SFIA skills are defined by levels of responsibility, based on autonomy, influence, complexity, business skills, and knowledge. Although this unit may cover knowledge and skills at higher levels, it is expected that graduates of undergraduate degrees will be capable of operating at Level 2 overall.

Seoul Accord

The UC generic attributes address graduate attributes 1, 6, 7, 9, and 10 of the Seoul Accord. The remaining graduate attributes that are covered in this unit are:

2. Knowledge for Solving Computing Problems

3. Problem Analysis

4. Design/Development of Solutions

5. Modern Tool Usage

8. Computing Professionalism and Society

EA Accreditation

This unit is part of courses accredited by Engineers Australia (EA)

This unit assesses and exposes students to the following Professional Engineer Stage 1 Competencies:

1.2 Conceptual understanding – Indicators Assessed: a

1.5 Knowledge – Indicators Exposed: a

2.2 Fluent application of engineering techniques, tools and resources – Indicators Assessed: b

2.3 Application of systematic engineering synthesis and design processes – Indicators Exposed: d

3.2 Effective oral and written communication in professional and lay domains – Indicators Assessed: a, b

3.3 Creative, innovative and pro-active demeanour – Indicators Exposed: a, c

3.4 Professional use and management of information – Indicators Assessed: a

3.5 Orderly management of self, and professional conduct - Indicators Assessed: b, e

3.6 Effective team membership and team leadership – Indicators Exposed: d, e

Timetable of activities

Week	Topic	Tutorial/workshop (continuous Assessment)	Assessment Due

1	Introduction, ICT context, and rich pictures	None	None
2	Requirements and stakeholders	Rich pictures	Quiz 1
3	Events, actions and responses	Stakeholder analysis	None
4	Context diagrams and data dictionaries	Event tables	Quiz 2
5	DFDs and process specifications	Context diagrams	Assignment 1 – Individual
6	Object oriented modelling and use cases	DFDs and process specifications	Quiz 3
7	Class diagrams	Use case diagrams	None
8	Class-free week	None	None
9	Activity diagrams	Class diagrams	Quiz 4, Assignment 2 – Individual
10	State machine diagrams	Activity diagrams	None
11	Sequence diagrams	State machine diagrams	Quiz 5
12	Analysis and modelling in ICT projects	Sequence diagrams	Presentation - Individual

13	Review	Review and reflection	Assignment Group	3	–

All assessment items are due at 11:59pm on Sundays at the end of the respective week. See section 5b Assessment Requirements below for full details. In the event of any disparity between the table above and section 5b, section 5b will take precedence.

Note that all topics are indicative only and may be subject to change. Please see the unit website for further information.

Unit resources

Required texts

The recommended textbooks are:

Satzinger, JW, Jackson, JW & Burd, SD, 2016, Systems Analysis and Design in a Changing World, 7th ed, Cengage Learning.

Seidl, M, Scholz, M, Huemer, C & Kappel, G, 2015, UML @ Classroom An Introduction to Object-Oriented Modeling, Springer

These textbooks are available for loan from the university library, or for purchase online or through the campus bookshop.

Materials and equipment

Students are required to use computers to access resources in this unit as well as performing assessable work. Computing resources for this unit are available in the laboratories on campus.

Unit website

Each unit you are enrolled in has an online teaching site in the learning management system UCLearn. You access UCLearn through MyUC.

Communications with students

Students are expected to check the unit online teaching site and their university email frequently and regularly.Information conveyed to students by these means will be considered to be received by students.

Assessment

Assessment item details

Quizzes

Due date

Five quizzes throughout the semester, due at the following times:

11:59pm Sunday Week 2

11:59pm Sunday Week 4

11:59pm Sunday Week 6

11:59pm Sunday Week 9

11:59pm Sunday Week 11

Weighting

10%

The best four results from the five quizzes will be used to calculate the 10% quiz grade. A quiz that is not completed will receive 0 marks.

Assessment details

Five quizzes throughout the semester, to be completed individually. Each quiz will open after the lecture during the week before the due date. Each quiz consists of 10 questions of various types including but not limited to multiple choice, multiple selection, and matching. Each quiz has a time limit of 20 minutes. More information will be provided on the unit teaching website.

Addresses learning outcomes

- 3. Use international standard systems description paradigms and languages;
- 4. Explain the role of analysis within various systems development life cycles;
- 5. Understand the role of systems models in the synthesis of systems; and

Related graduate attributes

1. UC graduates are professional
    - display initiative and drive, and use their organisation skills to plan and manage their workload
    - employ up-to-date and relevant knowledge and skills
    - take pride in their professional and personal integrity
2. UC graduates are global citizens
    - make creative use of technology in their learning and professional lives

Presentation - Individual

Due date

11:59pm Sunday Week 12

Weighting

10%

Assessment details

A 2.5 to 3 minute recorded video to be submitted electronically. The presentation will cover one aspect from the unit of the student's choice. More information will be provided on the unit's website.

Addresses learning outcomes

On successful completion of this unit, students should be able to:

- 1. Analyse IT-supported processes and hence derive appropriate system models;
- 3. Use international standard systems description paradigms and languages;
- 4. Explain the role of analysis within various systems development life cycles;

Related graduate attributes

1. UC graduates are professional
    - communicate effectively
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Assignment 1 - Individual

Due date

11:59pm Sunday Week 5

Weighting

25%

Assessment details

A written report of no more than 12 pages maximum to be submitted online via the unit's website. This assignment is to be completed individually. Students will be expected to perform analysis and modelling tasks and provide additional explanation in the report, based on a case study to be chosen from several provided options. More information will be provided on the unit teaching website.

Addresses learning outcomes

On successful completion of this unit, students should be able to:

- 1. Analyse IT-supported processes and hence derive appropriate system models;
- 2. Use abstraction as a modelling device;
- 3. Use international standard systems description paradigms and languages;
- 4. Explain the role of analysis within various systems development life cycles;
- 6. Apply tools for managing analysis processes.

Related graduate attributes

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Assignment 2 - Group

Due date

11:59pm Sunday Week 9

Weighting

20%

Additional information

Students may be expected to describe the relative contributions of each of their group members (including themselves), and this information may be used to calculate individual marks for each group member. See section 5b for more information.

Assessment details

A written report of no more than 12 pages maximum to be submitted online via the unit's website. This assignment will be completed in groups of no more than 4 students. Groups will be expected to perform analysis and modelling tasks and provide additional explanation in the report, based on a case study to be chosen from several provided options. More information will be provided on the unit teaching website.

Addresses learning outcomes

On successful completion of this unit, students should be able to:

- 1. Analyse IT-supported processes and hence derive appropriate system models;
- 2. Use abstraction as a modelling device;
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Assignment 3 - Group

Due date

11:59pm Sunday Week 13

Weighting

25%

Additional information

Students may be expected to describe the relative contributions of each of their group members (including themselves), and this information may be used to calculate individual marks for each group member. See section 5b for more information.

Assessment details

A written report of no more than 12 pages maximum to be submitted online via the unit's website. This assignment will be completed in groups of no more than 4 students. Groups will be expected to perform analysis and modelling tasks and provide additional explanation in the report, based on a case study to be chosen from several provided options. More information will be provided on the unit teaching website.

Addresses learning outcomes

On successful completion of this unit, students should be able to:

- 1. Analyse IT-supported processes and hence derive appropriate system models;
- 2. Use abstraction as a modelling device;
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- 5. Understand the role of systems models in the synthesis of systems; and
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Tutorial Assessment

Due date

Either:

Contribution at weekly tutorials, Weeks 2-7 and 9-13 inclusive, or:

Submission due 11:59pm Sunday Weeks 2-7 and 9-13 inclusive.

Weighting

10%

The best ten results from the 11 tutorial contributions/submissions will be used to calculate the 10% tutorial submission grade. Not attending a tutorial for a given week and not completing a tutorial submission will receive 0 marks.

Additional information

Late submissions for the alternative submissions for the tutorial assessments are not accepted, as these submissions are marked on a complete/incomplete basis only.

Assessment details

The tutorial assessments are intended to encourage and reward participation and contribution during the tutorials, or otherwise actively engaging with each week's topics and demonstrating that you are practicing analysis and modelling activities and preparing yourself for the other assessments in this unit.

For students who attend the tutorial, the tutor will provide a 'complete' mark based upon the following threshold:

The student has actively participated or contributed in a relevant manner for the week's tutorial topic. For example, this would involve performing the individual work elements of the tutorial exercise, actively participating and contributing to the group work elements by providing ideas and commentary on other group members' ideas, and/or participating in class discussion by providing examples to discuss or by asking questions and commenting on other students' examples.

For students who do not attend the tutorial or do not receive a complete score during the tutorial, you have the opportunity to submit a short submission that demonstrates reasonable and relevant progress for the week's tutorial exercise. At minimum, this will usually take the form of draft or completed work matching that of the combined individual and group work components of the week's tutorial exercise.

More information will be provided on the unit's website.

Addresses learning outcomes

On successful completion of this unit, students should be able to:

- 1. Analyse IT-supported processes and hence derive appropriate system models;
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Submission of assessment items

Late submissions for the alternative submissions for the tutorial assessments are not accepted, as these submissions are marked on a complete/incomplete basis only.

Extensions

Students can apply for an extension to the submission due date for an assessment item due to extenuating, evidenced circumstances (specific details are found in the Assessment Procedures). An extension must be applied for before the due date. Documentary evidence (e.g. medical certificate) will be expected for an extension to be granted, however this will not guarantee that the application will be successful. The Unit Convener or relevant Program Director/Course Convener will decide whether to grant an extension and the length of the extension.

An Assignment Extension form is available from the Student Forms page.

Late submissions

The following late submission period and penalty is applicable to any teaching period commencing after 1 April 2024.

To support the provision of timely feedback to students within the unit, late penalties will apply for summative assessments where late submission is permitted. Late submissions without an approved extension or reasonable adjustment will result in a penalty of a mark reduction of 10% of the maximum available marks for the assessment item per day (or part thereof) up to and including three calendar days. If a student submits more than three calendar days late without an approved extension or reasonable adjustment, the student will be allocated a mark of zero for that assessment, with no feedback provided.

Approval of extensions based on extenuating circumstances will be dependent upon the production of supporting documentation and at the discretion of the unit convener.

For teaching periods commencing prior to 1 April 2024, a late penalty of 5 % of the maximum available marks for the assessment item per day (or part thereof) was applied up to and including seven calendar days. An assignment submitted over 7 days late will not be accepted.

Special assessment requirements

The final unit mark will be calculated by adding together the weighted scores of all assessment items (see section 5 for assessment items and weightings).

The final unit mark will be converted into the final unit grade following the university grading schema as described in the policies and procedures.

The unit convener reserves the right to question students on any of their submitted work and may adjust awarded marks based on this questioning.

Supplementary assessment

Refer to the Assessment Policy and Assessment Procedures

Academic integrity

Students have a responsibility to uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others' work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices that contravene academic values. Refer to the University's Student Charter for more information.

To enhance understanding of academic integrity, all students are expected to complete the Academic Integrity Module (AIM) at least once during their course of study. You can access this module within UCLearn (Canvas) through the 'Academic Integrity and Avoiding Plagiarism' link in the Study Help site.

Use of Text-Matching Software

The University of Canberra uses text-matching software to help students and staff reduce plagiarism and improve understanding of academic integrity. The software matches submitted text in student assignments against material from various sources: the internet, published books and journals, and previously submitted student texts.

Group Member Evaluation

Adjustment of group assessment items based on individual contributions

In order to recognise the contributions of individual members in a team environment, the following process may apply:

Group project assessment will be group based and marked for the whole group.
Each individual in a group may receive an adjusted individual mark, based on the group mark and adjusted according to the relative contribution

of each individual in the group. The contribution of each individual will be determined based on comments and ratings provided by other members of the group. Marks will not be adjusted to be greater than 100% of the available marks.

Student responsibility

Learner engagement

Activity	Weekly workload (hours)	Number of weeks	Unit workload (hours)
Lecture attendance	2	12	24
Weekly topic independent study	1	12	12
Tutorial attendance	2	11	22
Quizzes (including pre-study and review)	2	5	10
Assignment 1 – Individual	-	-	25
Assignment 2 – Group	-	-	20
Assignment 3 - Group	-	-	25
Presentation - Individual	-	-	12
Total	-	-	150

Inclusion and engagement

It is strongly recommended that students who need assistance in undertaking the unit because of disability or an ongoing health condition register with the Inclusion and Engagement Office as soon as possible so that reasonable adjustment arrangements can be made.

Participation requirements

Your participation in both class and online activities will enhance your understanding of the unit content and therefore the quality of your assessment responses. Lack of participation may result in your inability to satisfactorily pass assessment items.

Withdrawal

If you are planning to withdraw please discuss with your Unit Convener. UC College students must also seek advice from the College.

Required IT skills

Ability to use a computer, including using office productivity software. You will be expected to teach yourself how to use visualisation and modelling software including CASE tools throughout this unit.

This unit involves online meetings in real time using the Virtual Room in your UCLearn teaching site. The Virtual Room allows you to communicate in real time with your lecturer and other students. To participate verbally, rather than just typing, you will need a microphone. For best audio quality we recommend a microphone and speaker headset. For more information and to test your computer, go to the Virtual Room in your UCLearn site and 'Join Course Room'. This will trigger a tutorial to help familiarise you with the functionality of the virtual room.

Work integrated learning

None

Student feedback

All students enrolled in this unit will have opportunities to provide anonymous feedback on the unit through the InterFace Student Experience Questionnaire (ISEQ). The request for your feedback will be posted on your InterFace page at least twice during a teaching period. InterFace can be accessed through MyUC.

Changes to unit based on student feedback

As a result of student feedback, the following changes have recently been made to the unit:

- Revision of the tutorial assessment to (primarily) in-class assessment, to reduce student workload in preparing submissions
- Revisions of all provided case studies (for the lecture, tutorial, and assignments) to improve consistency of language and presentation, improving alignment between the different types of case studies
- Rescheduling of assessment items to distribute assessment load across several weeks
- An interactive worked example has been added to lectures to provide guided examples of work expected in tutorials and assignments

Authority of this unit outline

This unit outline must be read in conjunction with the University of Canberra's Policies and Procedures, including the Assessment Policy and associated Procedure. The Assessment Policy and Assessment Procedure include information on matters such as plagiarism, grade descriptors, moderation, feedback, and deferred exams.

Any change to the information contained in the Academic content and Assessment sections of this document, will only be made by the Unit Convener if the written agreement of the Program Director and a majority of students has been obtained; and if written advice of the change is then provided on the teaching site in UCLearn. If this is not possible, written advice of the change must be then forwarded to each student enrolled in the unit at their registered term address. Any individual student who believes themselves to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.

Authority Text

Main

> Exception – Potential changes to a unit's learning activities and assessment items (Approved Academic Board 2020)
>
> In the event of Australian Government and/or ACT Government directive, such as those requiring physical distancing and restrictions on movement because of a pandemic, learning activities and/or assessment items in some units may change. These changes will not be updated in the published Unit Outline but will be communicated to students via the unit's UCLearn (Canvas) teaching site. The new learning activities and/or assessment items will continue to meet the unit's learning outcomes, as described in the Unit Outline.
>
> New learning activities and/or assessment items will be available on the unit's UCLearn (Canvas) teaching site. Please contact the Unit Convener with any questions.

UC acknowledges the Ngunnawal people, traditional custodians of the lands where Bruce campus is situated. We wish to acknowledge and respect their continuing culture and the contribution they make to the life of Canberra and the region. We also acknowledge all other First Nations Peoples on whose lands we gather.