



COIT20275 Systems Science and Engineering

Term 1 - 2019

Profile information current as at 25/04/2024 05:00 pm

All details in this unit profile for COIT20275 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

Systems engineering considers both the business and the technical needs of all customers, with the goal of providing a quality product that meets the user requirements. In this unit you will focus on the realisation and deployment of successful systems through the structured development process that proceeds through the entire systems life-cycle.

Details

Career Level: *Postgraduate*

Unit Level: *Level 9*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisite or Corequisite BUSN20016 Research in Business

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 1 - 2019

- Brisbane
- Melbourne
- Online
- Sydney

Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**

Weighting: 30%

2. **Written Assessment**

Weighting: 20%

3. **Examination**

Weighting: 50%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Teaching team feedback

Feedback

Textbook replacement.

Recommendation

The current textbook was published in 2011. A more recent textbook, published in 2018 has been sourced: Faulconbridge, I. and Ryan, M. (2018) Systems Engineering Practice, Argos Press. The unit website will be updated for the 2019 offerings to reflect the use of the new textbook.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Describe the processes of development and management of systems over the systems life cycle
2. Critically evaluate the importance of feedback control loop and human factors in the preliminary and detailed system design
3. Critically evaluate and report the common management processes used in the development, implementation and disposal of real or simulated systems
4. Apply appropriate processes in the optimisation of systems using reliability testing, sustainability and evaluation

N/A

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 20%	•	•	•	•
2 - Written Assessment - 30%	•	•	•	•
3 - Examination - 50%	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Knowledge	○	○	○	○
2 - Communication	○	○	○	○

Graduate Attributes	Learning Outcomes			
	1	2	3	4
3 - Cognitive, technical and creative skills	○	○	○	○
4 - Research	○	○	○	○
5 - Self-management	○	○	○	○
6 - Ethical and Professional Responsibility	○	○	○	○
7 - Leadership				
8 - Aboriginal and Torres Strait Islander Cultures				

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes							
	1	2	3	4	5	6	7	8
1 - Written Assessment - 20%	○	○	○	○	○	○		
2 - Written Assessment - 30%	○	○	○	○	○	○		
3 - Examination - 50%	○	○	○		○	○		

Textbooks and Resources

Textbooks

COIT20275

Prescribed

Systems Engineering Practice

Revised Edition (2018)

Authors: M.J. Ryan and I. Faulconbridge

Argos Press

Canberra , ACT , Australia

ISBN: 978-1-921138-07-2

Binding: Paperback

Additional Textbook Information

Paper copies are available at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- MS Office
- MS Visio

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)
For further information, see the Assessment Tasks.

Teaching Contacts

Dennis Jarvis Unit Coordinator
d.jarvis@cqu.edu.au

Schedule

Week 1 - 11 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
The systems landscape	Textbook: Chapter 1	

Week 2 - 18 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Intoduction to Systems Engineering	Textbook: Chapter 1	

Week 3 - 25 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Requirements engineering	Textbook: Chapter 2	

Week 4 - 01 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Conceptual design	Textbook: Chapter 3	

Week 5 - 08 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Preliminary design	Textbook: Chapter 5	

Vacation Week - 15 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 22 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Detailed design and development; Construction/production	Textbook: Chapter 5; Textbook: Chapter 6	Written Assessment Due: Week 6 Friday (26 Apr 2019) 11:55 pm AEST

Week 7 - 29 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Operational use and system support; Testing	Textbook: Chapter 7; Textbook: Chapter 8	

Week 8 - 06 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Development approaches	Textbook: Chapter 11	

Week 9 - 13 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Design for usability	Online material	

Week 10 - 20 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Design for reliability and maintainability

Online material

Week 11 - 27 May 2019

Module/Topic

Chapter

Events and Submissions/Topic

Producibility, disposability and sustainability

Online material

Written Assessment Due: Week 11 Friday (31 May 2019) 11:55 pm AEST

Week 12 - 03 Jun 2019

Module/Topic

Chapter

Events and Submissions/Topic

Systems engineering management; Systems Engineering Standards

Textbook: Chapter 8; Textbook: Chapter 9

Review/Exam Week - 10 Jun 2019

Module/Topic

Chapter

Events and Submissions/Topic

Exam Week - 17 Jun 2019

Module/Topic

Chapter

Events and Submissions/Topic

Assessment Tasks

1 Written Assessment

Assessment Type

Written Assessment

Task Description

In this group assessment, you are required to write a report which critically analyses the conceptual design phase of a systems engineering project. The case study can be from any application area. The report is to analyse the stakeholder needs that gave rise to the project, the transformation of these needs into requirements and the design alternatives that were (or could have been) considered.

The details of this assessment will be available on the unit website in Week 1.

Assessment Due Date

Week 6 Friday (26 Apr 2019) 11:55 pm AEST

Return Date to Students

Two weeks after submission.

Weighting

30%

Assessment Criteria

Marking Assessment Criteria: Weighted 30%

1. Introduction (5 Marks)
2. Stakeholder needs (10 Marks)
3. Conceptual design process (20 Marks)
4. System requirements (5 marks)
5. Conclusion (5 marks)
6. Research skills (10 marks)
7. Layout and presentation (5 Marks)

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online Group

Submission Instructions

One submission per group

Learning Outcomes Assessed

- Describe the processes of development and management of systems over the systems life cycle
- Critically evaluate the importance of feedback control loop and human factors in the preliminary and detailed system design
- Critically evaluate and report the common management processes used in the development, implementation and disposal of real or simulated systems
- Apply appropriate processes in the optimisation of systems using reliability testing, sustainability and evaluation

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

2 Written Assessment

Assessment Type

Written Assessment

Task Description

Functional Analysis and Allocation (FA&A) is a key process in systems engineering design. In this group assignment you are to critically review the FA&A process. The review is to address the following:

- inputs and outputs for the FA&A process
- the staging of the FA&A process within the system lifecycle
- approaches/methods for performing both analysis and allocation

This is to be a general review - there is no requirement for it to be grounded in your case study from assignment 1. The details of this assessment will be available on the unit website in Week 1.

Assessment Due Date

Week 11 Friday (31 May 2019) 11:55 pm AEST

Return Date to Students

Two weeks after submission.

Weighting

20%

Assessment Criteria

Marking Assessment Criteria: Weighted 20%

1. Introduction (2.5 Marks)
2. Overview of the FA&A process (purpose, inputs, outputs, staging, supporting processes) (5 marks)
3. Approaches/methods for functional analysis (10 marks)
4. Approaches/methods for functional allocation (10 marks)
5. Conclusion (2.5 marks)
6. Research skills (5 marks)
7. Layout and presentation (5 Marks)

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online Group

Submission Instructions

One submission per group

Learning Outcomes Assessed

- Describe the processes of development and management of systems over the systems life cycle
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- Critically evaluate and report the common management processes used in the development, implementation and

- disposal of real or simulated systems
- Apply appropriate processes in the optimisation of systems using reliability testing, sustainability and evaluation

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

50%

Length

180 minutes

Exam Conditions

Open Book.

Materials

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem