



COIT20258 Software Engineering

Term 1 - 2024

Profile information current as at 30/04/2024 02:50 am

All details in this unit profile for COIT20258 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

In this unit you will learn both theoretical and practical aspects of software engineering. The theory will focus on software processes, requirements engineering, system models and modelling, architectural design, object-oriented design, and software development methodology. The theoretical and practical aspects of software testing, and quality management including quality assurance, and quality control are also discussed. You will also be introduced to the principles of software evolution and configuration management. You will develop layered software application having presentation, application and data layers, addressing authentic software use, thus building solid foundation for software development.

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

Pre-requisites: COIT20247 Database Design and Development, COIT20256 Data Structures and Algorithms, and COIT20248 Information Systems Analysis and Design. Anti-requisites: COIT20226 Software Design and Implementation. 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 - 2024

- Brisbane
- Melbourne
- Online
- Rockhampton
- 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. **Practical Assessment**

Weighting: 20%

2. **Practical Assessment**

Weighting: 35%

3. **Project (applied)**

Weighting: 45%

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 Unit Coordinator

Feedback

Too many topics make it hard to learn for students and difficult to assess the learning outcomes

Recommendation

Reduce the number of topics

Unit Learning Outcomes

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

1. Develop models of the proposed multi-tiered software application as per the requirements identified following formal requirements engineering procedures
2. Design system architecture and components using design patterns and object-oriented design
3. Develop three-tiered software applications using agile and plan-driven methods
4. Plan and conduct test-driven development, validation and verification testing
5. Assess software quality measures and maintenance requirements of software applications
6. Work independently and collaboratively in small teams.

Australian Computer Society (ACS) recognises the Skills Framework for the Information Age (SFIA). SFIA is a widely used and consistent definition of ICT skills. SFIA is increasingly being used when developing job descriptions and role profiles. ACS members can use the tool MySFIA to build a skills profile at <https://www.acs.org.au/professionalrecognition/mysfia-b2c.html>.

This unit contributes to the following workplace skills as defined by SFIA 7. The SFIA code is included:

- Requirements Definition and management (REQM)
- User experience analysis (UNAN)
- User experience design (HCEV)
- Software Design (SWDN)
- System Integration and Build (SINT)
- Programming/Software Development (PROG)
- Data modelling and design (DTAN)
- Database Design (DBDS)
- Testing (TEST)
- Quality assurance (QUAS)
- Quality management (QUMG).

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Practical Assessment - 20%	•					

Textbooks and Resources

Textbooks

COIT20258

Prescribed

Software Engineering

Edition: 10 (2018)

Authors: Ian Sommerville

Pearson Education

Edinburgh Gate , Essex , England

ISBN: 978129209613-1

Binding: Paperback

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Zoom (both microphone and webcam capability)
- MySQL Community Server 8.0.26 (available from <https://dev.mysql.com/downloads/mysql/>)
- JavaFX 11.0.12 (available from <https://gluonhq.com/products/javafx/>)
- Git version Control (available from <https://git-scm.com/download/win>)
- NetBeans 20 (available from: <https://netbeans.apache.org/front/main/download/nb20/>)
- Open JDK 21 (available from: <https://jdk.java.net/21/>)
- Scene Builder 21 (available from: <https://gluonhq.com/products/scene-builder/>)
- Jakarta EE 10 (available from <https://jakarta.ee/release/10/>)

Referencing Style

All submissions for this unit must use the referencing styles below:

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Mahbub Ahmed Unit Coordinator

m.ahmed@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Professional Software Development and Software Processes	Chapters 1 and 2	

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Agile Software Development and Requirements Engineering	Chapters 3 and 4 (Sections 4.1 - 4.3).	

Week 3 - 18 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Requirements Engineering and System Modeling	Chapters 4 (Sections 4.4 - 4.6) and 5	

Week 4 - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Architectural Design and O-O Design	Chapters 6 and 7 (section 7.1)	Assignment 1 Due: Week 4 Thursday (28 Mar 2024) 11:59 pm AEST

Week 5 - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Design, Implementation, and Programmatic Creation of Databases	Chapter 7 and online materials	

Vacation Week - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 15 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Software Testing	Chapter 8	

Week 7 - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Quality Management	Chapter 24	

Week 8 - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Software Evolution	Chapter 9	Assignment 2 Due: Week 8 Thursday (2 May 2024) 11:59 pm AEST

Week 9 - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Configuration Management	Chapter 25	

Week 10 - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Dependable Systems and Reliability Engineering	Chapters 10 and 11	

Week 11 - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Software Reuse and Component Based Software Engineering	Chapters 15 and 16	

Week 12 - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Service-Oriented Software Engineering	Chapter 18	

Review/Exam Week - 03 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
		Assignment 3 Due: Review/Exam Week Thursday (6 June 2024) 11:59 pm AEST

Exam Week - 10 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Unit Coordinator (UC): Dr Mahbub Ahmed, PhD (Deakin University, Australia)

UC contact: m.ahmed@cqu.edu.au

UC location: Melbourne Campus

Assessment Tasks

1 Assignment 1

Assessment Type

Practical Assessment

Task Description

You will demonstrate your ability to analyse a given case study, apply the principles of requirement engineering by eliciting functional and non-functional requirements and documenting system and user requirements specifications. You will also choose appropriate modelling techniques to model the system and design the system architecture. You will use the topics learnt in Weeks 1- 4 in this assignment.

For comprehensive details, refer to the Assignment 1 Specification document available on the Moodle Unit website.

Assessment Due Date

Week 4 Thursday (28 Mar 2024) 11:59 pm AEST

Due Week 4 Thursday (28 March 2024) 11:59 pm AEST instead of Week 4 Friday (29 March 2024) due to 29 March 2024 through 1 April 2024 being public holidays.

Return Date to Students

Week 6 Thursday (18 Apr 2024)

Weighting

20%

Assessment Criteria

1. Analyse the given case study, identify system and user requirements
2. Elicit functional and non-functional requirements following formal requirements engineering procedures
3. Create a requirements specification document
4. Apply modeling techniques to develop models of the system

Referencing Style

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Online

Submission Instructions

Submit only .doc or .docx files using the submission link available on the Moodle Unit website.

Learning Outcomes Assessed

- Develop models of the proposed multi-tiered software application as per the requirements identified following formal requirements engineering procedures

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills

2 Assignment 2

Assessment Type

Practical Assessment

Task Description

You are required to follow the already completed system model and requirement specification to implement, build,

debug, and test a software application having a three-tiered architecture with a front-end graphical user interface (GUI), a middle layer implementing the business logic, and a back-end to persist the data. You will document the detailed design of the application. You will also be documenting a test plan to systematically test the developed application and a quality plan retrospectively prepared to demonstrate how you would have commenced the application development with a quality plan in place to deliver a system meeting the quality requirements. You will use the topics learnt in Weeks 1-7 in this assignment.

For comprehensive details, refer to the Assignment 2 Specification document available on the Moodle Unit website.

Assessment Due Date

Week 8 Thursday (2 May 2024) 11:59 pm AEST

Return Date to Students

Week 10 Thursday (16 May 2024)

Weighting

35%

Assessment Criteria

1. Design a software application following the requirement specification developed in Assignment 1.
2. Follow object-oriented design principles to design a three-tiered software application.
3. Document software application design and test plans.
4. Implement a software application, consisting of presentation, application and data layers.
5. Develop a retrospective quality plan that would have been created to deliver the application meeting quality requirements.
6. Conduct test-driven development, and validation testing.

Referencing Style

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Online

Submission Instructions

Submit a zip file containing source code files and a .doc or .docx file for report using the submission link available on the Moodle Unit website..

Learning Outcomes Assessed

- Design system architecture and components using design patterns and object-oriented design
- Develop three-tiered software applications using agile and plan-driven methods
- Plan and conduct test-driven development, validation and verification testing

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Self-management

3 Assignment 3

Assessment Type

Project (applied)

Task Description

This is a group assessment. In this assessment, you will work in a team of three to five members to develop a three-tiered software application. You will demonstrate your ability to analyse a given case study and develop requirement specifications and a quality plan to implement a three-tiered software application. You will document both system and user requirements, system architecture, and a detailed design of the system. Your software application will have a front-end graphical user interface(GUI), a business logic layer, and a data persistence layer. You will follow both agile and plan-driven development to implement the software application. You will use test-driven development to build the system, assembling program components developed by team members using a version control system.

Also, individual students of a group must submit a separate report (also known as Individual report) critically evaluating the team's performance and their own performance in the team. The report also has to identify areas for improvement. For example, a group leader of a group G1 will submit a zip file containing group project source code files, combined group project report, and his/her Individual report. The remaining

members in the group G1 will submit their respective Individual reports.

For comprehensive details, refer to the Assignment 3 Specification document available on the Moodle Unit website.

Assessment Due Date

Review/Exam Week Thursday (6 June 2024) 11:59 pm AEST

Return Date to Students

Results will be published on the grade certification date.

Weighting

45%

Assessment Criteria

1. Work as a small team collaborating in all aspects of software development.
2. Analyse the given case study and identify system and user requirements.
3. Document requirement specification containing functional and non-functional requirements.
4. Develop a test plan and design documents.
5. Create a quality plan to meet the software quality requirements.
6. Implement a three tiered software application following agile and plan driven development.
7. Use a version control system for system building integrating components developed by team members.
8. Conduct tests and verification using software tools.

Referencing Style

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Online Group

Submission Instructions

Submit a zip file containing group project source code files, combined group project report, and Individual report using the submission link available on the Moodle Unit website.

Learning Outcomes Assessed

- Develop models of the proposed multi-tiered software application as per the requirements identified following formal requirements engineering procedures
- Design system architecture and components using design patterns and object-oriented design
- Develop three-tiered software applications using agile and plan-driven methods
- Plan and conduct test-driven development, validation and verification testing
- Assess software quality measures and maintenance requirements of software applications
- Work independently and collaboratively in small teams.

Graduate Attributes

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

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