



# COIT20258 Software Engineering

## Term 2 - 2022

Profile information current as at 10/04/2024 12:08 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 2 - 2022

- 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%	•					

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
2 - Practical Assessment - 35%		•	•	•		
3 - Project (applied) - 45%	•	•	•	•	•	•

## Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Knowledge	○	○	○	○		
2 - Communication	○	○		○		○
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 - Practical Assessment - 20%	○	○	○					
2 - Practical Assessment - 35%	○	○	○		○			
3 - Project (applied) - 45%	○	○	○	○	○	○	○	

## 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 Database Server 8.0.22 available from <https://downloads.mysql.com/archives/installer/>
- Scene Builder 18.0.0 from <https://gluonhq.com/products/scene-builder/>
- JavaFx 18.0.1 available from <https://gluonhq.com/products/javafx/>
- OpenJDK 18.0.1.1

## Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Farzad Sanati** Unit Coordinator

[f.sanati@cqu.edu.au](mailto:f.sanati@cqu.edu.au)

**Salahuddin Azad** Unit Coordinator

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## Schedule

### Week 1 - 11 Jul 2022

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

### Week 2 - 18 Jul 2022

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

### Week 3 - 25 Jul 2022

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

#### Week 4 - 01 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Architectural Design and O-O Design	Chapters 6 and 7 (section 7.1)	

#### Week 5 - 08 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Design, Implementation, and Programmatic Creation of Databases	Chapter 7 and online materials	<b>Assignment 1</b> Due: Week 5 Friday (12 Aug 2022) 11:45 pm AEST

#### Vacation Week - 15 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Enjoy the break.		

#### Week 6 - 22 Aug 2022

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

#### Week 7 - 29 Aug 2022

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

#### Week 8 - 05 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Software Evolution	Chapter 9	<b>Assignment 2</b> Due: Week 8 Friday (9 Sept 2022) 11:45 pm AEST

#### Week 9 - 12 Sep 2022

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

#### Week 10 - 19 Sep 2022

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

#### Week 11 - 26 Sep 2022

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

#### Week 12 - 03 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
Service-Oriented Software Engineering	Chapter 18	<b>Assignment 3</b> Due: Week 12 Friday (7 Oct 2022) 11:45 pm AEST

#### Review/Exam Week - 10 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
Review all Chapters.		

#### Exam Week - 17 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
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## Term Specific Information

Contact information for Dr Farzad Sanati: Email: f.sanati@cqu.edu.au; Office: Room 1.17, CQU Townsville Campus; P +61 7 4726 5386 | X 55386.

## 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 specification. 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. Complete details are in the Assignment 1 Specification document available on the Moodle unit website.

**Assessment Due Date**

Week 5 Friday (12 Aug 2022) 11:45 pm AEST

**Return Date to Students**

Week 7 Friday (2 Sept 2022)

**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 \(author-date\)](#)

**Submission**

Online

**Submission Instructions**

Submit only .doc or .docx files using the submission link available on the 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, debug, and test a software application having a three-layered 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. Complete details are in the Assignment 2 Specification document available on the Moodle unit website.

**Assessment Due Date**

Week 8 Friday (9 Sept 2022) 11:45 pm AEST

**Return Date to Students**

Week 10 Friday (23 Sept 2022)

**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 \(author-date\)](#)

**Submission**

Online

**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** or **four** members to develop a three-layered software application. You will demonstrate your ability to analyse a given case study, develop requirement specification and a quality plan to implement a three-layered 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.

You can choose your team members to form a group, and you must inform your tutor of the members before the end of Week 3. Teams may include students from different locations (e.g. on-campus and online students). You will be required to regularly meet with your team (e.g. in class and/or online video meetings), apply collaboration tools (e.g., task tracking, issue management, version control), and report progress and issues to your tutor.

Complete details are in the Assignment 3 Specification document available on the Moodle unit website.

**Assessment Due Date**

Week 12 Friday (7 Oct 2022) 11:45 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 \(author-date\)](#)

**Submission**

Online Group

**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