



# COIT20258 Software Engineering

## Term 2 - 2021

Profile information current as at 25/04/2024 08:09 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 - 2021

- 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 Student Evaluation

**Feedback**

Generally, all aspects of this unit have received a strong agreement in the level of satisfaction, especially the learning of software engineering processes, model-driven development, and the use of many industry standard tools.

**Recommendation**

Keep the current structure and content including the teaching of software engineering processes and the industry practices and standards.

#### Feedback from Unit coordinator reflection.

**Feedback**

Workshops can be more interactive including activities to promote engagement, practice, and discussions.

**Recommendation**

Review workshop materials and update as necessary to include short task completion activities.

## 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).



## 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

#### Additional Textbook Information

Both paper and eBook versions can be purchased 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)
- JDK 11 - OpenJDK
- MySql Database Server 8.0.22 available from <https://downloads.mysql.com/archives/installer/>
- JavaFX 11.0 or later available from <https://gluonhq.com/products/javafx/>
- Scene Builder 11 or later available from <https://gluonhq.com/products/scene-builder/>

## 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)

## Schedule

### Week 1 - 12 Jul 2021

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

### Week 2 - 19 Jul 2021

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

### Week 3 - 26 Jul 2021

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 - 02 Aug 2021

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

#### Week 5 - 09 Aug 2021

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 (13 Aug 2021) 11:45 pm AEST

#### Vacation Week - 16 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
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#### Week 6 - 23 Aug 2021

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

#### Week 7 - 30 Aug 2021

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

#### Week 8 - 06 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Software Evolution	Chapter 9	

#### Week 9 - 13 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Configuration Management	Chapter 25	<b>Assignment 2</b> Due: Week 9 Tuesday (14 Sept 2021) 11:45 pm AEST

#### Week 10 - 20 Sep 2021

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

#### Week 11 - 27 Sep 2021

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

#### Week 12 - 04 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
Service-Oriented Software Engineering	Chapter 18	<b>Assignment 3</b> Due: Week 12 Friday (8 Oct 2021) 11:45 pm AEST

#### Review/Exam Week - 11 Oct 2021

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

#### Exam Week - 18 Oct 2021

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

The unit coordinator of this term is:  
Dr. Farzad Sanati  
School of Engineering & Technology  
Central Queensland University  
Rockhampton QLD 4702, Australia  
Phone: +61 7 4726 5386  
Email: f.sanati@cqu.edu.au

## Assessment Tasks

### 1 Assignment 1

#### Assessment Type

Practical Assessment

#### Task Description

You will demonstrate your ability to analyse the 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. In this assignment task, you will be using the topics learnt in Weeks 1-4. Complete details are in the Assignment 1 Specification document available from the Unit website.

#### Assessment Due Date

Week 5 Friday (13 Aug 2021) 11:45 pm AEST

#### Return Date to Students

Week 6 Friday (27 Aug 2021)

#### Weighting

20%

#### Assessment Criteria

1. Analyse 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), 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 be using the topics learnt in weeks 1-7 in this assignment. Complete details are in the Assignment 2 Specification document available from the Unit website.

### Assessment Due Date

Week 9 Tuesday (14 Sept 2021) 11:45 pm AEST

### Return Date to Students

Week 11 Friday (1 Oct 2021)

### Weighting

35%

### Assessment Criteria

1. Design a software application following requirement specification developed in Assignment One.
2. Follow object-oriented design for detailed design of 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

You will demonstrate your ability to analyse a given case study, develop requirement specification and a quality plan to implement a three tiered software application. You will document both system and user requirements, system architecture, and 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 as a small team implementing the software application. You will use test-driven development and build the system, assembling program components developed by team members using version control system.

### Assessment Due Date

Week 12 Friday (8 Oct 2021) 11:45 pm AEST

### Return Date to Students



Results will be published on 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 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 revision control system for system building integrating components developed by team members.
8. Conduct testing and verification using software tools.

**Referencing Style**

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

**Submission**

Online

**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