COIT12200 *Software Design & Development*
Term 1 - 2024

All details in this unit profile for COIT12200 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
This unit introduces object-oriented software design and implementation, including the use of complex data structures and algorithms.You will learn data structures, algorithms, and both theoretical and practical aspects of software engineering. The theory will focus on software processes, requirements engineering, modelling, architectural design, design patterns, software development methodology, testing, and quality assurance. You will also be introduced to the principles of software reuse, and development code management. You will develop multi-tiered software application consisting of presentation, application, and data persistence tiers. You will also learn test-driven software application development using appropriate tools, thus building solid foundations for software development.

Details
Career Level: *Undergraduate*
Unit Level: *Level 2*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
Pre-requisites: (COIT11134 and COIT11237) OR (COIT11134 and COIT12167).
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
- Cairns
- 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 Undergraduate 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 and Written Assessment**
Weighting: 25%
2. **Practical and Written Assessment**
Weighting: 30%
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.

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 feedback

Feedback

Need a clearer provision about each student contribution to the final paired project - Assessment Item 3.

Recommendation

We will update the marking criteria related to teamwork part in the final project, which will set a clear provision or clause related to each team member's contribution to the project.

Feedback from Student feedback

Feedback

The current textbook emphasises software development theories. Weekly Lecture slides have too many pages.

Recommendation

We are considering reducing the number of lecture slides. The adopted textbook is a classic book in the field of software development but indeed weekly lecture slides have too many pages that need to be reduced.

Feedback from Self-reflection

Feedback

We should add some contents in Week 12 related to security engineering. In Assessment Item 3 (Project), we add the requirement of Authentication.

Recommendation

We are considering adding the Authentication requirement for Assessment Item 3 in the next offering. The study materials or tutorial materials in Week 12 will add SHA1/256 algorithm for encrypting the password that can be stored in a table in a MySQL database.

Unit Learning Outcomes

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

1. Create a software requirements specification in accordance with the principles of requirements engineering
2. Apply modelling techniques to document architectural and system models as per the requirements specification
3. Use complex data structures and algorithms in software application development
4. Design and implement a multi-tiered software application consisting of presentation, application and data persistence tiers
5. Conduct test-driven development, validation, verification testing, software project testing, and design walkthroughs 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 8. The SFIA code is included:

- Requirements Definition and management (REQM)
- User Experience Analysis (UNAN)
- Software Design (SWDN)
- System Integration and Build (SINT)
- Programming/Software Development (PROG)
- Database Design (DBDS)
- Testing (TEST)
- Quality Assurance(QUAS)
- Quality Management (QUMG)

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level · Introductory Level · Intermediate Level · Graduate Level ∘ Professional Level ∘ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Practical and Written Assessment - 25%			•		
2 - Practical and Written Assessment - 30%	•	•		•	
3 - Project (applied) - 45%	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
1 - Communication	•	•			•
2 - Problem Solving	•	•	•	•	•
3 - Critical Thinking	•		•	•	•
4 - Information Literacy	•	•			•
5 - Team Work					
6 - Information Technology Competence	•	•		•	
7 - Cross Cultural Competence					
8 - Ethical practice					
9 - Social Innovation					
10 - Aboriginal and Torres Strait Islander Cultures					

Textbooks and Resources

Textbooks
COIT12200

Prescribed

Engineering Software Products: An Introduction to Modern Software Engineering
Edition: 1st (2019)
Authors: Ian Sommerville
Pearson Higher Ed
USA
ISBN: 9780135210642
Binding: Paperback
COIT12200

Prescribed

Java How to Program (Late Objects, Global Edition)
Edition: 11th (2019)
Authors: Paul Deitel & Harvey Deitel
Pearson
USA
ISBN: 978-1292273730
Binding: eBook

Additional Textbook Information
Textbook 2 can be treated as either Prescribed or Supplementary textbook, as we just use it first four weeks lecture slides
and most learining materails are available from the moodle website.
Textbook 1 covers eight weeks lecture slides.

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Violet Uml editor 2.1.0 or later
- NetBeans 12.4 or higher version
- MySQL Community Server 8.0.29 or higher
- Java 17 (OpenJDK) or Oracle JDK 17
- JavaFX SceneBuilder 21.0.0

Referencing Style

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

Teaching Contacts

Michael Li Unit Coordinator
m.li@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Algorithms, and Recursion	Deitel&Deitel, Chapter 18&19	

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Data Structures (Part 1) - Lists, Linkedlists, Iterators, and Stacks	Deitel&Deitel, Chapter 16&21	

Week 3 - 18 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Data Structures (Part 2) - Queues, Sets, Maps, and Trees	Deitel&Deitel, Chapter 16&21	

Week 4 - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Java Database Application Developments	Deitel&Deitel, Chapter 24	

Week 5 - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Requirement Engineering	Reference Book, Chapter 4	**Assignment 1** Due: Week 5 Friday (5 Apr 2024) 11:55 pm AEST

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 Architecture	Sommerville, Chapter 4	

Week 7 - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Design and Implementation	Reference Book, Chapter 7	

Week 8 - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Reliable Programming and Design Patterns	Sommerville, Chapter 8	

Week 9 - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Software Testing	Sommerville, Chapter 9	

Week 10 - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Agile Software Engineering	Sommerville, Chapter 2	**Assignment 2** Due: Week 10 Friday (17 May 2024) 11:55 pm AEST

Week 11 - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Security and Privacy	Sommerville, Chapter 7	

Week 12 - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
DevOps, Code Management, and Software Quality	Sommerville, Chapter 10 Reference book, Chapter 24	

Review/Exam Week - 03 Jun 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
		Applied Project Due: Review/Exam Week Friday (7 June 2024) 11:55 pm AEST

Exam Week - 10 Jun 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Term Specific Information

Reference Book: Software Engineering,10th Edition, Ian Sommerville (2016), Pearson Higher Ed

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Assessment Tasks

1 Assignment 1

Assessment Type
Practical and Written Assessment

Task Description
In this assignment, you will use the key constructs and concepts introduced in Weeks 1- 3 to develop and test software applications that employ a Graphical User Interface (GUI) and use complex data structures and algorithms. Further details are in the detailed Assignment 1 specification available on the Moodle unit website.

Assessment Due Date
Week 5 Friday (5 Apr 2024) 11:55 pm AEST

Return Date to Students
Week 7 Friday (26 Apr 2024)

Weighting
25%

Assessment Criteria
This is an individual assignment and contributes to 25% of the total marks.

- Design and Implementaion
- Language use including correct applicaions of classes, data structures, algorithms, and programming good practices.
- Documentation
- Testing

Referencing Style

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

Submission
Online

Learning Outcomes Assessed

- Use complex data structures and algorithms in software application development

2 Assignment 2

Assessment Type
Practical and Written Assessment

Task Description
You will demonstrate your ability to apply the principles of requirement engineering by eliciting the functional and non-functional requirements, documenting requirements specification, modelling the system, and designing the system architecture and implementation. In this assignment task, you will be using the topics learned in Weeks 4-7. Complete details are in the Assignment 2 specification document available from the Unit website.

Assessment Due Date
Week 10 Friday (17 May 2024) 11:55 pm AEST

Return Date to Students
Week 12 Friday (31 May 2024)

Weighting
30%

Assessment Criteria
This is an individual assignment and contributes to 30% of the total marks.

- Apply software design and development principles.
- Complete appropriate documentation for requirements, system modelling, and design, software implementation.
- Illustrate a detailed design for a layered information system using appropriate design methods.

Referencing Style

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

Submission
Online

Learning Outcomes Assessed

- Create a software requirements specification in accordance with the principles of requirements engineering
- Apply modelling techniques to document architectural and system models as per the requirements specification
- Design and implement a multi-tiered software application consisting of presentation, application and data persistence tiers

3 Applied Project

Assessment Type
Project (applied)

Task Description
In this assessment task, you are required to develop, 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 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 learned in weeks 1-12 in this assignment. Complete task details are in the Assignment 3 specification document available from the Unit website.

Assessment Due Date
Review/Exam Week Friday (7 June 2024) 11:55 pm AEST

Return Date to Students

Weighting
45%

Assessment Criteria
This is a team work and contributes to 45% of the total marks.

- Analyze the given problem and design a three-tier software application by following the software development principle.
- Complete appropriate documentation for requirements, system modeling, design, and software implementation. Implement the designed system including the graphical user interface, business logic and database objects.
- Rigorous testing of software applications.
- Use quality management in the development processes.

Referencing Style

- Harvard (author-date)

Submission
Online Group

Learning Outcomes Assessed

- Create a software requirements specification in accordance with the principles of requirements engineering
- Apply modelling techniques to document architectural and system models as per the requirements specification
- Use complex data structures and algorithms in software application development
- Design and implement a multi-tiered software application consisting of presentation, application and data persistence tiers
- Conduct test-driven development, validation, verification testing, software project testing, and design walkthroughs in small teams.

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