MATH11246 *Essentials of Applied Mathematics*
Term 1 - 2023

Profile information current as at 24/04/2024 02:50 pm

General Information

Overview
In this unit, you will apply essential mathematical concepts, processes and techniques to develop mathematical descriptions and models for problems in science, engineering, business, and other disciplines. You will learn and apply the properties of linear, quadratic, exponential, and logarithmic rules in appropriate settings and use trigonometric rules to solve relevant problems. You will also practice effective communication of results, concepts, and ideas using mathematics as a language in a way that demonstrates a clear, logical, and precise approach.

Details
Career Level: *Undergraduate*
Unit Level: *Level 1*
Credit Points: *6*
Student Contribution Band: *7*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
Anti-requisite: MATH11160.
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 - 2023

- Online
- Rockhampton

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. **Written Assessment**
Weighting: 25%
2. **Written Assessment**
Weighting: 25%
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 Unit evaluation

Feedback
The edited recordings provided helpful support for flexible learning

Recommendation
Continue to offer a positively supported learning experience

Feedback from Unit evaluation

Feedback
Frequent technical difficulties in the teaching room interrupted weekly lectures for both the teacher and students

Recommendation
Will keep requesting the IT team provide better IT support for teaching and learning

Unit Learning Outcomes

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

1. Demonstrate foundation mathematics skills with emphasis on those areas applicable to multiple disciplines
2. Formulate and analyse simple mathematical models
3. Apply theory to practical problems drawn from a range of disciplines
4. Solve unfamiliar problems using foundation mathematics techniques
5. Communicate results, concepts, and ideas in context using mathematics as a language.

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 - Written Assessment - 25%	•	•			•
2 - Written Assessment - 25%			•	•	•
3 - Examination - 50%	•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
1 - Communication	•	•	•	•	•

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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					

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 25%	•	•	•	•						
2 - Written Assessment - 25%	•	•	•	•						
3 - Examination - 50%	•	•	•	•						

Textbooks and Resources

Textbooks

MATH11246

Prescribed

Essentials and Examples of Applied Mathematics (2nd Ed)
Edition: 2nd edn (2021)
Authors: William Guo
Pearson Australia
Melbourne , Victoria , Australia
ISBN: 9780655703624
Binding: Paperback

Additional Textbook Information
Textbooks can be accessed online at the CQUniversity Library website. If you prefer your own copy, you can purchase either paper or eBook versions 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)
- Access to a document scanner and/or pdf converter (all assessment submitted electronically as pdf file)
- Access to a printer (for printing assessment and tutorial materials)
- Access to a webcam, speaker and microphone or a headset. (For participating in Zoom lectures and tutorials.)

Referencing Style

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

Teaching Contacts

Roland Dodd Unit Coordinator
r.dodd@cqu.edu.au

Schedule

Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Unit preview Review: Algebra (1)	Section 1.1 Numbers and Operations (1)	Read Section 1.1 Complete Exercises 1.1 in textbook

Week 2 - 13 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Review: Algebra (2)	Section 1.1 Numbers and Operations (2)	Read Sections 1.1 Complete Exercises 1.1 in textbook

Week 3 - 20 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic

Review: Algebra (3)	Section 1.2 Algebraic Expressions and Operations	Read Section 1.2 Complete Exercises 1.2 in textbook
Week 4 - 27 Mar 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review: Algebra (4)	Section 1.3 Factoring Algebraic Expressions Section 1.4 Algebraic Fraction Operations	Read Sections 1.3-1.4 Complete Exercises 1.3 & 1.4 in textbook
Week 5 - 03 Apr 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review: Algebra (5)	Section 1.5 Equations	Read Section 1.5 Complete Exercises 1.5 in textbook
Vacation Week - 10 Apr 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Mid-Term Break		
Week 6 - 17 Apr 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review: Triangles and Trigonometry (1)	Section 2.1 Plane Angles and General Properties of Triangles	Read Section 2.1 Complete Exercises 2.1 in textbook **Assignment 1** Due: Week 6 Thursday (20 Apr 2023) 5:00 pm AEST
Week 7 - 24 Apr 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review: Triangles and Trigonometry (2)	Section 2.2.1 Trigonometric Functions of General Angles	Read Section 2.2.1 Complete Exercises 2.2 in textbook
Week 8 - 01 May 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review: Triangles and Trigonometry (3)	Section 2.2.2 Trigonometric Identities and Relationships	Read Section 2.2.2 Complete Exercises 2.2 in textbook
Week 9 - 08 May 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review: Triangles and Trigonometry (4)	Section 2.3 Oblique Triangles and Laws of Sines and Cosines Section 2.4 Summary of Basic Geometry	Read Sections 2.3-2.4 Complete Exercises 2.3 & 2.4 in textbook
Week 10 - 15 May 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Inequalities, Absolute Values, Equations and Inequalities	Section 3.1 Inequalities Section 3.2 Absolute Values, Equations and Inequalities	Read Sections 3.1-3.2 Complete Exercises 3.1 & 3.2 in textbook
Week 11 - 22 May 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Sequences and Series	Section 3.3 Sequences and Series	Read Section 3.3 Complete Exercises 3.3 in textbook **Assignment 2** Due: Week 11 Thursday (25 May 2023) 5:00 pm AEST
Week 12 - 29 May 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Unit review and examination preparation	Unit Review and Examination Preparation	

Review/Exam Week - 05 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 12 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Unit Coordinator: Dr Roland Dodd
email: r.dodd@cqu.edu.au
Telephone (Office): (07) 4923 2877
Office: CQUniversity, North Rockhampton Campus, Building 30, First Floor, Room 1.18.
If you have any individual queries, please do not hesitate to email me and I will get back to you within two business days.

Assessment Tasks

1 Assignment 1

Assessment Type
Written Assessment

Task Description
This is an individual assignment. This assignment is to test student's learning outcomes for topics studied in Weeks 1-5. The assignment details are provided on the Moodle website.

Assessment Due Date
Week 6 Thursday (20 Apr 2023) 5:00 pm AEST

Return Date to Students

It is envisaged that feedback and solutions will be available in two weeks, or as soon as the marking process is completed.

Weighting
25%

Assessment Criteria
The final mark is out of 25. Questions are awarded the full marks allocated if they are error-free, partial marks if there are some problems, and no marks if not attempted or contain so many errors as to render the attempt to be without value. To ensure maximum benefit, answers to all questions should be neatly and clearly presented and all appropriate working should be shown. Assignments will receive NO marks if submitted after the solutions are released.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit one PDF or word file through the Moodle website.

Learning Outcomes Assessed

- Demonstrate foundation mathematics skills with emphasis on those areas applicable to multiple disciplines
- Formulate and analyse simple mathematical models
- Communicate results, concepts, and ideas in context using mathematics as a language.

Graduate Attributes

- Communication

- Problem Solving
- Critical Thinking
- Information Literacy

2 Assignment 2

Assessment Type
Written Assessment

Task Description
This is an individual assignment. This assignment is to test student's learning outcomes for topics studied in Weeks 6-10. The assignment details are provided on the Moodle website.

Assessment Due Date
Week 11 Thursday (25 May 2023) 5:00 pm AEST

Return Date to Students

It is envisaged that the feedback and solutions will be available before the exam if all students submitted this assignment on time.

Weighting
25%

Assessment Criteria
The final mark is out of 25. Questions are awarded the full marks allocated if they are error-free, partial marks if there are some problems, and no marks if not attempted or contain so many errors as to render the attempt to be without value. To ensure maximum benefit, answers to all questions should be neatly and clearly presented and all appropriate working should be shown. Assignments will receive NO marks if submitted after the solutions are released.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit one PDF or word file through the Moodle website.

Learning Outcomes Assessed

- Apply theory to practical problems drawn from a range of disciplines
- Solve unfamiliar problems using foundation mathematics techniques
- Communicate results, concepts, and ideas in context using mathematics as a language.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

Examination

Outline
Complete an invigilated examination.

Date
During the examination period at a CQUniversity examination centre.

Weighting
50%

Length
180 minutes

Minimum mark or grade
20 (40% of 50 marks)

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