



MATH11246 *Essentials of Applied Mathematics*

Term 1 - 2021

Profile information current as at 05/05/2024 05:30 pm

All details in this unit profile for MATH11246 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 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 - 2021

- Online

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 In class, by email, through Moodle

Feedback

Many students had difficulty in applying basic math operations, which was assumed prerequisite knowledge.

Recommendation

Consider adjustments to coverage of all math units for education students to increase the teaching time in introductory mathematics.

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



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	•	•	•	•	•
2 - Problem Solving	•	•	•	•	•
3 - Critical Thinking	•	•	•	•	•

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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 (2020)

Authors: William Guo

Pearson Australia

Melbourne , Victoria , Australia

ISBN: 9780655703624

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)
- 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

William Guo Unit Coordinator
w.guo@cqu.edu.au

Schedule

Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review: Algebra (1)	Textbook: Section 1.1 Numbers and Operations	Read Section 1.1 Complete exercise 1.1 in textbook Optional: Reading material for Week 1 (compiled by Dr Wang) Optional: Exercises in reading material for Week 1

Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review: Algebra (2)	Textbook: Section 1.2 Algebraic expressions and operations	Read Section 1.2 Complete exercise 1.2 in textbook Optional: Reading material for Week 2 (compiled by Dr Wang) Optional: Exercises in reading material for Week 2

Week 3 - 22 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review: Algebra (3)	Textbook: Section 1.3 Factoring Algebraic Expressions Textbook: Section 1.4 Algebraic Fraction Operations	Read Section 1.3-1.4 Complete exercises 1.3 & 1.4 in textbook Optional: Reading material for Week 3 (compiled by Dr Wang) Optional: Exercises in reading material for Week 3

Week 4 - 29 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review: Algebra (4)	Textbook: Section 1.5 Equations	Read Section 1.5 Complete exercise 1.5 in textbook Optional: Reading material for Week 4 (compiled by Dr Wang) Optional: Exercises in reading material for Week 4

Week 5 - 05 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review: Triangles and Trigonometry (1)	Textbook: Section 2.1 Plane Angles and General Properties of Triangles	Read Section 2.1 Complete exercise 2.1 in textbook Optional: Reading material for Week 5 (compiled by Dr Wang) Optional: Exercises in reading material for Week 5

Vacation Week - 12 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Mid-Term Break		
Week 6 - 19 Apr 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Review: Triangles and Trigonometry (2)	Textbook: Section 2.2.1 Trigonometric functions of general angles	Read Section 2.2.1 Complete exercise 2.2.1 in textbook Optional: Reading material for Week 6 (compiled by Dr Wang) Optional: Exercises in reading material for Week 6 Assignment 1 Due: Week 6 Friday (23 Apr 2021) 11:59 pm AEST
Week 7 - 26 Apr 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Review: Triangles and Trigonometry (3)	Textbook: Section 2.2.2 Trigonometric identities and relationships	Read Section 2.2.2 Complete exercise 2.2.2 in textbook Optional: Reading material for Week 7 (compiled by Dr Wang) Optional: Exercises in reading material for Week 7
Week 8 - 03 May 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Review: Triangles and Trigonometry (4)	Textbook: Section 2.3 Oblique Triangles and Laws of Sines and Cosines Textbook: Section 2.4 Summary of Basic Geometry	Read Sections 2.3-2.4 Complete exercises 2.3 & 2.4 in textbook Optional: Reading material for Week 8 (compiled by Dr Wang) Optional: Exercises in reading material for Week 8
Week 9 - 10 May 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Inequalities, Absolute Values, Equations and Inequalities	Textbook: Section 3.1 Inequalities Textbook: Section 3.2 Absolute Values, Equations and Inequalities	Read Sections 3.1-3.2 Complete exercises 3.1 & 3.2 in textbook Optional: Reading material for Week 9 (compiled by Dr Wang) Optional: Exercises in reading material for Week 9
Week 10 - 17 May 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Sequences and Series	Textbook: Section 3.3 Sequences and Series	Read Section 3.3 Complete exercise 3.3 in textbook
Week 11 - 24 May 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Functions and Graphs	Textbook: Section 4.1 Introduction to Functions and Graphs	Read Section 4.1 Complete exercise 4.1 in textbook Assignment 2 Due: Week 11 Friday (28 May 2021) 11:59 pm AEST
Week 12 - 31 May 2021		
Module/Topic	Chapter	Events and Submissions/Topic
Unit review and examination preparation		

Review/Exam Week - 07 Jun 2021

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 14 Jun 2021

Module/Topic	Chapter	Events and Submissions/Topic
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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 of topics studied in Weeks 1-5. The assignment details are provided on the Moodle website.

Assessment Due Date

Week 6 Friday (23 Apr 2021) 11:59 pm AEST

Extension request must be lodged before the assignment due. No extension can be granted to this assignment once the solution is released.

Return Date to Students

Week 8 Friday (7 May 2021)

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 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 of topics studied in Weeks 6-10. The assignment details are provided on the Moodle website.

Assessment Due Date

Week 11 Friday (28 May 2021) 11:59 pm AEST

Extension request must be lodged before the assignment due. No extension can be granted to this assignment once the solution is released.

Return Date to Students

Review/Exam Week Wednesday (9 June 2021)

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

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Submission

Online

Submission Instructions

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Learning Outcomes Assessed

- Apply theory to practical problems drawn from a range of disciplines
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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

40% (20 marks or higher out of the 50 marks available in the exam)

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