MATH11160 *Technology Mathematics*

Term 3 - 2023

Profile information current as at 12/10/2024 07:03 pm

All details in this unit profile for MATH11160 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 support the development of mathematical descriptions and models for problems in science and engineering domains. You will investigate and apply the properties of linear, quadratic, exponential, and logarithmic functions in appropriate settings, use trigonometric functions to solve relevant problems and describe periodic phenomena. You will also learn and apply principles of applied calculus for describing and solving engineering problems. Other important elements of this unit are the 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-requisites: MATH11218, MATH11246Pre-requisite: MATH11247
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 3 - 2023

- 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. **Online Quiz(zes)**
Weighting: 20%
2. **Written Assessment**
Weighting: 20%
3. **Written Assessment**
Weighting: 20%
4. **Examination**
Weighting: 40%

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 data

Feedback
The unit requirements score in the student survey dropped.

Recommendation
In the beginning of the term all assignments and assessment requirements in the unit need to be presented to the students.

Feedback from Unit evaluation data

Feedback
The useful learning materials score in the student survey declined.

Recommendation
The specific example problem solutions discussed in the class need to be shared with the students with clear working steps.

Feedback from Unit evaluation data

Feedback
The learning from the assessments score in the student survey plummeted.

Recommendation
A specific class time may be arranged to discuss the student's mistakes in their submitted assignments.

Feedback from Unit evaluation data

Feedback
The useful feedback score in the student survey decreased.

Recommendation
Tutorial classes along with separate consultation time may be allocated.

Feedback from Unit evaluation data

Feedback
The overall student satisfaction score in the student survey was reduced

Recommendation
Following the previously listed recommendations may improve the student satisfaction score.

Unit Learning Outcomes

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

1. Demonstrate foundation mathematics skills with emphasis on application to engineering disciplines
2. Formulate and analyse simple mathematical models
3. Apply theory to practical problems drawn from a range of engineering disciplines
4. Solve engineering related problems using foundation mathematics and introductory calculus techniques.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Professional Engineers in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Introductory 1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 4N) 1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 3N 4N) 2.1 Application of established engineering methods to complex engineering problem-solving. (LO: 3N 4N)

Intermediate 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 1N 2N 3I 4N)
Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N – Introductory, I – Intermediate and A - Advanced. **Refer to the Engineering Undergraduate Course Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping informationhttps://moodle.cqu.edu.au/course/view.php?id=1511**

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
1 - Online Quiz(zes) - 20%	•	•		
2 - Written Assessment - 20%			•	•
3 - Written Assessment - 20%			•	•
4 - Examination - 40%	•	•		

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving	•	•	•	•

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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 - Online Quiz(zes) - 20%		•	•	•						
2 - Written Assessment - 20%	•	•	•	•						
3 - Written Assessment - 20%	•	•	•	•						
4 - Examination - 40%	•	•	•	•						

Textbooks and Resources

Textbooks

MATH11160

Prescribed

Essentials and Examples of Applied Mathematics
2nd edition (2020)
Authors: William W. Guo
Pearson Australia
Sydney , NSW , 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)
- Computer - ability to access study materials, including instructional videos and scan and upload assessment.

Referencing Style

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

Teaching Contacts

Antony Dekkers Unit Coordinator
a.dekkers@cqu.edu.au

Schedule

Week 1 - 06 Nov 2023

Module/Topic	Chapter	Events and Submissions/Topic
Unit Introduction Functions and Graphs	Textbook: Chapter 4	Read Chapter 4; complete Week 1 exercises

Week 2 - 13 Nov 2023

Module/Topic	Chapter	Events and Submissions/Topic
Polynomial Functions	Textbook: Chapter 5	Read Chapter 5; complete Week 2 exercises

Week 3 - 20 Nov 2023

Module/Topic	Chapter	Events and Submissions/Topic
Exponential and Logarithmic Functions	Textbook: Chapter 6	Read Chapter 6; complete Week 3 exercises Online Quiz 1 opens Monday.

Week 4 - 27 Nov 2023

Module/Topic	Chapter	Events and Submissions/Topic

Trigonometric and Hyperbolic Functions	Textbook: Chapter 7	Read Chapter 7; complete Week 4 exercises Online Quiz 1 continues.
Vacation Week - 04 Dec 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Mid-Term Break		
Week 5 - 11 Dec 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Introduction to Calculus (I)	Textbook: Chapter 10.1-10.2	Read Chapter 10.1-10.2; complete Week 5 exercises Online Quiz 1 closes on Sunday.
Week 6 - 18 Dec 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Introduction to Calculus (II)	Textbook: Chapter 10.3, 10.4 (Example 10.36-37), 11.1 (Examples 11.1, 11.2, 11.3)	Read Chapter 10.3, 10.4 (Example 10.36-37), 11.1 (Examples 11.1, 11.2, 11.3); complete Week 6 exercises. Online Quiz 2 opens Monday. **Assignment 1** Due: Week 6 Friday (22 Dec 2023) 11:45 pm AEST
Vacation Week - 25 Dec 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Mid-Term Break		
Week 7 - 01 Jan 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Introduction to Calculus (III)	Textbook: Chapter 11.2, 11.3, 11.4 (Examples 11.6-8, 11.20-23)	Read Chapter 11.2, 11.3, 11.4 (Examples 11.6-8, 11.20-23); complete Week 7 exercises Online Quiz 2 continues.
Week 8 - 08 Jan 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Introduction to Calculus (IV)	Textbook: Chapter 13.1, 14.1, 15 (Example 15.1-2, 15.7-8)	Read Chapter 13.1, 14.1, 15 (Example 15.1-2, 15.7-8); complete Week 8 exercises Online Quiz 2 closes on Sunday.
Week 9 - 15 Jan 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Introduction to Calculus (V)	Textbook: Chapter 16.1, 16.2.1 (Physical plane areas)	Read Chapter 16.1, 16.2.1 (Physical plane areas); complete Week 9 exercises Online Quiz 3 opens Monday.
Week 10 - 22 Jan 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Vectors	Textbook: Chapter 8	Events and Submissions/Topic Vectors Textbook: Chapter 8 Read Chapter 8; complete Week 10 exercises Online Quiz 3 continues.
Week 11 - 29 Jan 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Complex numbers	Textbook: Chapter 9	Read Chapter 9; complete Week 11 exercises Online Quiz 3 continues. **Assignment 2** Due: Week 11 Friday (2 Feb 2024) 11:45 pm AEST
Week 12 - 05 Feb 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Systems of Linear Equations Unit review and examination preparation	Textbook: Chapters 18.2, 18.3	Read Chapters 18.2, 18.3; complete Week 12 exercises Online Quiz 3 continues.
Exam Week - 12 Feb 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
		Online Quiz 3 closes on Sunday.

Term Specific Information

Unit Coordinator: Antony Dekkers
email: a.dekkers@cqu.edu.au
Telephone (Office): 0749309355
Office: Rockhampton, North, CQUniversity, Building 32, Ground Floor, Room G38.
If you have any individual queries, please do not hesitate to email me and I will get back to you within two working days.

Assessment Tasks

1 Online Progressive Quizzes

Assessment Type
Online Quiz(zes)

Task Description

- This assessment consists of three online progressive quizzes.
- The quizzes will cover the mathematical concepts and basic operations of all topics covered over the term.
- Details on questions will be released once a quiz session is open.
- The opening and closing dates for the quizzes are provided in the Unit Profile schedule and Moodle.

Number of Quizzes
3

Frequency of Quizzes
Other

Assessment Due Date

The dates for each quiz is detailed in the Schedule of the Unit Profile.

Return Date to Students

Your result will be automatically displayed on screen once you completed your final attempt.

Weighting
20%

Assessment Criteria

- Each question has 5 choices, of which only ONE is correct.
- You are allowed 3 attempts to answer a question, and the last answer will be saved and graded.
- No penalty is applied for multiple attempts.
- You get the full mark for a correct answer and no mark for an incorrect answer.
- No partial marks are available.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
You have up to three attempts for each question in the progressive quiz.

assessmentOutcome

- Demonstrate foundation mathematics skills with emphasis on application to engineering disciplines
- Formulate and analyse simple mathematical models

assessmentGradAttribute

- Problem Solving
- Critical Thinking
- Information Literacy

2 Assignment 1

Assessment Type
Written Assessment

Task Description

- This is an individual assignment.
- This assignment will test your knowledge of topics covered in Weeks 1-4.
- The assignment details will be available on the Moodle website.

Assessment Due Date
Week 6 Friday (22 Dec 2023) 11:45 pm AEST

Return Date to Students
Week 8 Friday (12 Jan 2024)

Weighting
20%

Assessment Criteria

- The final mark for this assignment is out of 20.
- Questions are awarded the full marks allocated if they are error-free.
- Partial marks are given if there are some errors.
- No marks are given if the question is not attempted or it contains so many errors as to render the attempt to be without value.
- Answers to all questions should be neatly and clearly presented and all appropriate working should be shown.
- Assignments will receive NO marks if submitted when the solutions are released.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit one PDF file through the unit Moodle website.

assessmentOutcome

- Apply theory to practical problems drawn from a range of engineering disciplines
- Solve engineering related problems using foundation mathematics and introductory calculus techniques.

assessmentGradAttribute

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

3 Assignment 2

Assessment Type
Written Assessment

Task Description

- This is an individual assignment.
- This assignment will test your knowledge of topics covered in Weeks 5-9.
- The assignment details will be available on the Moodle website.

Assessment Due Date
Week 11 Friday (2 Feb 2024) 11:45 pm AEST

Return Date to Students
Exam Week Monday (12 Feb 2024)

Weighting
20%

Assessment Criteria

- The final mark for this assignment is out of 20.
- Questions are awarded the full marks allocated if they are error-free.
- Partial marks are given if there are some errors.
- No marks are given if the question is not attempted or it contains so many errors as to render the attempt to be without value.
- 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 unit Moodle website.

assessmentOutcome

- Apply theory to practical problems drawn from a range of engineering disciplines
- Solve engineering related problems using foundation mathematics and introductory calculus techniques.

assessmentGradAttribute

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

Examination

Outline
Complete an invigilated examination.

Date
During the examination period at a CQUniversity examination centre.

Weighting
40%

Length
180 minutes

Minimum mark or grade
50%

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

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assessmentOutcome

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assessmentGradAttribute

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