



MATH12224 *Calculus B*

Term 2 - 2022

Profile information current as at 26/03/2023 10:14 pm

All details in this unit profile for MATH12224 have been officially approved by CQUUniversity 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 solve problems in geometry, science, engineering, business, and other disciplines through the application of integral calculus techniques. You will interpret the fundamental theorems of integration and evaluate integrals using the substitution rule, integration by parts, trigonometric substitution, and other numerical approximations. You will learn how to apply Taylor or Maclaurin series to represent and approximate nonlinear functions.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisite: MATH12223 Calculus and Linear Algebra A

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 - 2022

- 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 Lecturer's observation

Feedback

Students sometimes were caught in the middle between understanding the new topics and using or recalling mathematical knowledge and skills learnt in previous math units MATH11246/MATH12223.

Recommendation

Students will be reminded of adopting a progressive and recursive approach to mathematics learning whilst frequent in-class refreshing is provided as much as time allows.

Unit Learning Outcomes

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

1. Interpret the fundamental theorems of integration
2. Evaluate integrals using the substitution rule, integration by parts, trigonometric substitution, and other numerical approximations
3. Use Taylor or Maclaurin series to represent and approximate nonlinear functions
4. Apply integral calculus to solve problems in geometry, science, engineering, business, and other disciplines.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
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
1 - Communication	•	•	•	•
2 - Problem Solving	•	•	•	•
3 - Critical Thinking	•	•	•	•

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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

There are no required textbooks.

Additional Textbook Information

The textbook is the same book used in MATH12223. If you're new to CQU education mathematics, you may purchase a copy of the book from the CQU Bookshop: Essentials and Examples of Applied Mathematics (2nd Ed) by William Guo, published by Pearson in 2021/2022.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

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
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Schedule

Week 1 - 11 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Unit preview Solving Nonlinear Equations	Section 12.1 in Essentials and Examples of Applied Mathematics 2nd (2nd EEAM)	Read Section 12.1 Complete Week 1 exercises

Week 2 - 18 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Taylor and Maclaurin Series	Sections 12.2-12.3 in 2nd EEAM	Read Sections 12.2-12.3 Complete Week 2 exercises

Week 3 - 25 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Derivatives of Special Functions and Applications	Sections 10.5 and 11.1 (Examples 11.4 & 11.5) in 2nd EEAM	Read Sections 10.5 and 11.1 Complete Week 3 exercises

Week 4 - 01 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Differentials and Applications	Sections 13.1-13.2 in 2nd EEAM	Read Sections 13.1-13.2 Complete Week 4 exercises

Week 5 - 08 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Fundamentals of Indefinite Integration Integration by Substitution	Sections 14.1-14.2.1 in 2nd EEAM	Read Sections 14.1-14.2.1 Complete Week 5 exercises

Vacation Week - 15 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 22 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Integration by Parts	Section 14.2.2 in 2nd EEAM	Read Section 14.2.2 Complete Week 6 exercises Assignment 1 Due: Week 6 Wednesday (24 Aug 2022) 11:59 pm AEST

Week 7 - 29 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Integration by Complete Differentials and Partial Fractions	Sections 14.2.3-14.2.4 in 2nd EEAM	Read Sections 14.2.3-14.2.4 Complete Week 7 exercises

Week 8 - 05 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Applications of Indefinite Integration	Sections 15.1-15.2: Selected cases in 2nd EEAM	Read Sections 15.1-15.2 Complete Week 8 exercises

Week 9 - 12 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
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Essentials of Definite Integration Applications of Definite Integration (I)	Sections 16.1-16.2.1 (Physical areas) in 2nd EEAM	Read Sections 16.1-16.2.1 (First topic) Complete Week 9 exercises
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Week 10 - 19 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Applications of Definite Integration (II)	Section 16.2.1 (2nd-4th topics) in 2nd EEAM	Read Section 16.2.1 (2nd-4th topics) Complete Week 10 exercises

Week 11 - 26 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Applications of Definite Integration (III) Numeric Integration	Sections 16.2.2 (first topic) and 17.3 in 2nd EEAM	Read Sections 16.2.2 (first topic) and 17.3 Complete Week 11 exercises Assignment 2 Due: Week 11 Wednesday (28 Sept 2022) 11:59 pm AEST

Week 12 - 03 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
Examination preview and preparation		

Review/Exam Week - 10 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 17 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic

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 Wednesday (24 Aug 2022) 11:59 pm AEST

Return Date to Students

Week 8 Wednesday (7 Sept 2022)

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

- Interpret the fundamental theorems of integration
- Evaluate integrals using the substitution rule, integration by parts, trigonometric substitution, and other numerical approximations

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

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 Wednesday (28 Sept 2022) 11:59 pm AEST

Return Date to Students

Review/Exam Week Wednesday (12 Oct 2022)

It is envisaged that feedback and solutions will be available prior to sitting the standard examination.

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

- Use Taylor or Maclaurin series to represent and approximate nonlinear functions
- Apply integral calculus to solve problems in geometry, science, engineering, business, and other disciplines.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

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 the 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