



# MATH12224 *Calculus B*

## Term 2 - 2021

Profile information current as at 20/04/2024 07:36 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 - 2021

- 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 Student feedback from the unit evaluation

##### Feedback

Students commented very favorably upon the lecturing approach; provision of instructional videos; availability of supporting learning materials; the level of support provided by staff; and prompt attention to queries.

##### Recommendation

Continue to offer a positive, supported learning experience.

## 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

Students will use the same textbook used in previous units MATH11246 and MATH12223 during 2018-2021. New students may use the second edition of the textbook available in CQU Bookshop, but the contents are organized differently from the first edition.

### 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  
[w.guo@cqu.edu.au](mailto:w.guo@cqu.edu.au)

## Schedule

### Week 1 - 12 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Unit Introduction Review of Differentials Fundamentals of Indefinite integrals	Section 11.3.1 Differentials of Functions Section 12.1 Fundamentals of Indefinite integrals	Read Sections 11.3.1 & 12.1 Complete Week 1 exercises

### Week 2 - 19 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Integration by Substitution	Section 12.2.1 Integration by Substitution	Read Section 12.2.1; complete Week 2 exercises

### Week 3 - 26 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Integration by Parts	Section 12.2.2 Integration by Parts	Read Section 12.2.2; complete Week 3 exercises

### Week 4 - 02 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Integration by Complete Differentials and Partial Fractions	Sections 12.2.3-12.2.4 Integration by Complete Differentials and Partial Fractions	Read Sections 12.2.3-12.2.4; complete Week 4 exercises

### Week 5 - 09 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Applications of Indefinite Integration	Section 12.3 Applications of Indefinite Integration	Read Section 12.3; complete Week 5 exercises

### Vacation Week - 16 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
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### Week 6 - 23 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Essentials of Definite Integration	Section 13.1 Essentials of Definite Integration	Read Section 13.1; complete Week 6 exercises <b>Assignment 1</b> Due: Week 6 Wednesday (25 Aug 2021) 11:59 pm AEST

### Week 7 - 30 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Applications of Definite Integration (I)	Section 13.2.1 Applications of Definite Integration	Read Section 13.2.1; complete Week 7 exercises

### Week 8 - 06 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Applications of Definite Integration (II)	Sections 13.2.1-13.2.2 Applications of Definite Integration	Read Sections 13.2.1-13.2.2; complete Week 8 exercises

### Week 9 - 13 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Taylor polynomials and series	Sections 16.2 Taylor polynomials and series for approximation	Read Section 16.2; complete Week 9 exercises
<b>Week 10 - 20 Sep 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Numeric Integration	Section 16.3 Numeric Integration	Read Section 16.3; complete Week 10 exercises
<b>Week 11 - 27 Sep 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Derivatives of special functions and applications	Section 10.4 Derivatives of special functions	Read Section 10.4; complete Week 11 exercises  <b>Assignment 2</b> Due: Week 11 Wednesday (29 Sept 2021) 11:59 pm AEST
<b>Week 12 - 04 Oct 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Examination preview and preparation		
<b>Review/Exam Week - 11 Oct 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
<b>Exam Week - 18 Oct 2021</b>		
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 (25 Aug 2021) 11:59 pm AEST

#### Return Date to Students

Week 8 Wednesday (8 Sept 2021)

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 (29 Sept 2021) 11:59 pm AEST

**Return Date to Students**

Review/Exam Week Wednesday (13 Oct 2021)

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