MATH11246 *Essentials of Applied Mathematics*
Term 2 - 2020

Profile information current as at 07/05/2024 08:49 am

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 2 - 2020

- 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. **Take Home Exam**
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

— 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 - Take Home Exam - 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 - Take Home Exam - 50%	•	•	•	•				•		

Textbooks and Resources

Textbooks

MATH11246

Prescribed

ESSENTIALS AND EXAMPLES OF APPLIED MATHEMATICS

Edition: 1st edn (2018)
Authors: Guo, WW
Pearson Australia
Melbourne , VIC , Australia
ISBN: 9781488623820
Binding: Paperback

Additional Textbook Information

If you prefer to study with a paper copy, they are available at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code). eBooks are available at the publisher's website.

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

Clinton Hayes Unit Coordinator
c.hayes@cqu.edu.au

Schedule

Week 1 - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Numbers and operations	Chapter 1.1 (textbook) Week 1 reading material	Read Chapter 1.1 or Week 1 reading material; Complete exercise 1.1 in textbook; Try exercises in Week 1 reading material.

Week 2 - 20 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Algebraic expressions and operations	Chapter 1.2 (textbook); Week 2 reading material	Read Chapter 1.2 in textbook or Week 2 reading material; Complete 1.2 exercises; Try exercises in Week 2 reading material.

Week 3 - 27 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Factoring algebraic expressions	Chapter 1.3-1.4 (textbook); Week 3 reading material	Read Chapter 1.3 -1.4 in textbook or Week 3 reading material; Complete 1.3-1.4 exercises; Try exercises in Week 3 reading material.

Week 4 - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Equations	Chapter 1.5 (textbook); Week 4 reading material	Read Chapter 1.5 in textbook or Week 4 reading material; Complete 1.5 exercises; Try exercises in Week 4 reading material.

Week 5 - 10 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Introduction to trigonometry	Chapter 2.1 (textbook); Week 5 reading material.	Read Chapter 2.1 in textbook or Week 5 reading material; Complete 2.1 exercises in textbook; Try exercises in Week 5 reading material. **Assignment 1** Due: Week 5 Wednesday (12 Aug 2020) 11:00 pm AEST

Vacation Week - 17 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Mid-Term Break		

Week 6 - 24 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Trigonometric functions for any angles	Chapter 2.2.1 (textbook); Week 6 reading material.	Read Chapter 2.2.1 in textbook or Week 6 reading material; Complete Question 1-7 in exercise 2.2 in textbook; Try exercises in Week 6 reading material.

Week 7 - 31 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review: Trigonometric identities	Chapter 2.2.2 (textbook); Week 7 reading material.	Read Chapter 2.2.2 in textbook or Week 7 reading material; Complete Question 8-9 in exercise 2.2 in textbook; Try exercises in Week 7 reading material.

Week 8 - 07 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Functions: Solving oblique triangles	Chapter 2.3-2.4 (textbook); Week 8 reading material.	Read Chapter 2.3-2.4 in textbook or Week 8 reading material; Complete exercise 2.3 in textbook; Try exercises in Week 8 reading material.

Week 9 - 14 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic

Introduction to inequalities	Chapter 3.1-3.2 (textbook); Week 9 reading material.	Read Chapter 3.1-3.2 in textbook or Week 9 reading material; Complete exercise 3.1 and 3.2 in textbook; Try exercises in Week 9 reading material.

Week 10 - 21 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to functions and graphs	Chapter 4.1 (textbook); Week 10 reading material.	Read Chapter 4.1 in textbook or Week 10 reading material; Complete exercise 4.1 in textbook; Try exercises in Week 10 reading material.

Week 11 - 28 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Special functions and inverse functions	Chapter 4.2 (textbook); Week 11 reading material.	Read Chapter 4.2 in textbook or Week 11 reading material; Complete exercise 4.2 in textbook; Try exercises in Week 11 reading material. **Assignment 2** Due: Week 11 Wednesday (30 Sept 2020) 11:00 pm AEST

Week 12 - 05 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic
Unit review and examination preparation		

Review/Exam Week - 12 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 19 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Assignment 1

Assessment Type
Written Assessment

Task Description
This is an individual assignment.
Please see the unit Moodle site for the questions in this assignment. This assignment is to test student's learning outcomes in basic algebra reviewed in Weeks 1-4. Assignment 1 will be available for download under the "Assessment" block on the unit Moodle site, together with complete instructions for online submission of your solutions to the assignment questions. Marks will be deducted for assignments which are submitted late without prior permission or adequate explanation. Assignments will receive NO marks if submitted after the solutions are released (2 weeks after the assignment submission date) but will still be counted as submitted.

Assessment Due Date
Week 5 Wednesday (12 Aug 2020) 11:00 pm AEST
Extensions: Solutions to this assignment will be made available to students 2 weeks after the due date. Consequently, extension requests greater than 14 days will be denied except under exceptional circumstances.

Return Date to Students

Extensions: Solutions to this assignment will be made available to students 2 weeks after the due date. Consequently,

extension requests greater than 14 days will be denied except under exceptional circumstances.

Weighting
25%

Assessment Criteria
Questions are from unit content covered in Weeks 1-4. 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. The final Assignment 1 mark is scaled to an assessment weighting out of 25%. 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
Assignment 1 is uploaded as a single pdf document at the unit Moodle site for MATH11246. Full details are provided on the unit Moodle site.

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
- Ethical practice

2 Assignment 2

Assessment Type
Written Assessment

Task Description
This is an individual assignment.
Please see the unit Moodle site for the questions in this assignment. This assignment is to test student's learning outcomes in triangles, trigonometric identities and basic geometry and inequalities, absolute equations and inequalities covered in Weeks 5-10. Assignment 1 will be available for download under the "Assessment" block on the unit Moodle site, together with complete instructions for online submission of your solutions to the assignment questions. Marks will be deducted for assignments which are submitted late without prior permission or adequate explanation. Assignments will receive NO marks if submitted after the solutions are released (2 weeks after the assignment submission date) but will still be counted as submitted.

Assessment Due Date
Week 11 Wednesday (30 Sept 2020) 11:00 pm AEST
Extensions: Solutions to this assignment will be made available to students 2 weeks after the due date. Consequently, extension requests greater than 14 days will be denied except under exceptional circumstances.

Return Date to Students

Extensions: Solutions to this assignment will be made available to students 2 weeks after the due date. Consequently, extension requests greater than 14 days will be denied except under exceptional circumstances.

Weighting
25%

Assessment Criteria
Questions are from unit content covered in Weeks 5-10. 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. The final Assignment 1 mark is scaled to an assessment weighting out of 25%. 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
Assignment 2 is uploaded as a single pdf document at the unit Moodle site for MATH11246. Full details are provided on the unit Moodle site.

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
- Ethical practice

3 Take Home Exam

Assessment Type
Take Home Exam

Task Description
You will be able to access the take home exam paper from the Moodle website for MATH11246, under the Assessment block. To complete this Take Home Exam paper, you will need access to a printer and a scanner. Completion of this take home exam paper is limited to a duration of 24 hours. This duration will allow you to:

- print the assessment
- develop solutions to the posed questions
- scan the solutions to PDF file
- upload and submit to the Term 2, 2020 MATH11246 Moodle site

The 24 hour duration is a strict deadline. Submission of this take home exam paper will not be accepted once this deadline has passed.
Your submission is subject to additional verification in the form of oral defence through interview with the Unit Coordinator (or nominee). Students who are unable to satisfactorily answer questions about their submitted solution(s) will receive no marks for those solution(s).
This is an individual assignment. Students are reminded that all aspects of work submitted are to be the results of their own personal studies.
Further details on the availability and submission of the take home exam paper will be available on the MATH11246 Moodle website.

Assessment Due Date

The Take Home Exam will be scheduled during the examination period. The specific date and time to be advised via Moodle.

Return Date to Students

The results will be made available on Certification of Grades day. Like a regular exam, your marked answer script will not be returned to you, unless you apply to see it as part of the first step of the review of grade process.

Weighting
50%

Minimum mark or grade
Students must score a minimum of 50% of the marks available on the Take Home Exam.

Assessment Criteria
This assessment task is open book. You can reference all notes and study materials. Any submission after the deadline will not be accepted. You are required to do your own work, maintaining academic integrity with all honesty. Your submission may be subject to additional verification in the form of an oral defence through interview with the Unit Coordinator (or nominee). Students unable to satisfactorily answer questions about their submitted solution(s) will

receive no marks for these solutions(s).

Answered 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.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
The Take Home Exam is uploaded as a single PDF document at the unit Moodle site for MATH11246. Full details are provided on the unit Moodle site.

Learning Outcomes Assessed

- Demonstrate foundation mathematics skills with emphasis on those areas applicable to multiple disciplines
- Formulate and analyse simple mathematical models
- Apply theory to practical problems drawn from a range of disciplines
- Solve unfamiliar problems using foundation mathematics techniques

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Ethical practice

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