



# MATH11218 *Applied Mathematics*

## Term 1 - 2019

Profile information current as at 06/05/2024 07:46 pm

All details in this unit profile for MATH11218 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 study fundamental mathematical concepts, processes and techniques that are necessary to support subsequent studies in applied calculus. You will investigate the properties and applications of linear, quadratic, logarithmic and exponential functions. You will use trigonometry to solve triangles and trigonometric functions to model periodic phenomena. Complex numbers, vectors and matrix algebra will be used to develop solutions to problems. You will apply the concepts of elementary statistics to analyse data and introductory probability theory to predict the likelihood of occurrence of an event. Other important elements of this unit are the communication of results, concepts and ideas using mathematics as a language. Through the use of mathematical software you will visualise, analyse, validate and solve problems.

#### 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: MATH12223 or MATH12224

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 - 2019

- Bundaberg
- Cairns
- Gladstone
- Mackay
- 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: 20%

#### 2. **Written Assessment**

Weighting: 20%

#### 3. **Examination**

Weighting: 60%

### 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 unit evaluation.

##### Feedback

Some students commented on the timing of the lecture being so close to the tutorials.

##### Recommendation

The unit coordinator will try to work more closely with timetabling to try to provide more time between the allocated lecture and tutorial where possible.

#### Feedback from Student feedback from unit evaluation.

##### Feedback

Strong student feedback was received on the structure of the unit and assessments, topic coverage, lecture and tutorial quality, and the level of support offered by staff.

##### Recommendation

Continue to foster the current learning and teaching environment.

#### Feedback from Unit coordinator reflection.

##### Feedback

Some students would be better prepared for success in MATH11218 by undertaking additional mathematics studies to cover the assumed knowledge that is required in this unit.

##### Recommendation

Continue to promote the MATH11247 Foundation Mathematics unit to first-year engineering students, as preparation for MATH11218.

## Unit Learning Outcomes

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

1. Solve problems by applying the properties of linear, quadratic, logarithmic and exponential functions
2. Model periodic phenomena using trigonometric functions and apply trigonometry to solve triangles
3. Use complex numbers, vectors and matrix algebra to develop solutions to problems
4. Apply the concepts of elementary statistics to analyse data and introductory probability theory to predict the likelihood of occurrence of an event
5. Communicate results, concepts and ideas in context using mathematics as a language
6. Apply mathematical software to visualise, analyse, validate and solve problems.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 20%	•				•	•

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
2 - Written Assessment - 20%		•	•		•	•
3 - Examination - 60%	•	•	•	•		

## Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication	•	•	•	•	•	•
2 - Problem Solving	•	•	•	•	•	•
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 - Written Assessment - 20%	•	•				•		•		
2 - Written Assessment - 20%	•	•				•		•		
3 - Examination - 60%	•	•				•		•		

## Textbooks and Resources

### Textbooks

MATH11218

#### Prescribed

##### Engineering Mathematics

5th edition (2017)

Authors: Croft, Davison, Flint & Hargeaves

Pearson

Harlow, Essex, UK

ISBN: 9781292146652

Binding: Paperback

#### Additional Textbook Information

The purchase of this textbook will cover students for studies in both MATH11218 Applied Mathematics and the follow on MATH11219 Applied Calculus unit.

Copies are available to purchase at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

### 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

**Roland Dodd** Unit Coordinator

[r.dodd@cqu.edu.au](mailto:r.dodd@cqu.edu.au)

## Schedule

### Week 1 - 11 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 1.1, 1.2, 1.4 to 1.5	Chapter 1: Review of algebraic techniques	Textbook Exercises 1.2, 1.4 to 1.5 and Week 1 Tutorial Exercises

### Week 2 - 18 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 1.6 to 1.8	Chapter 1: Review of algebraic techniques	Textbook Exercises 1.6 to 1.8 and Week 2 Tutorial Exercises

### Week 3 - 25 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 2.1 to 2.3, 2.4.1, 2.4.2, 2.4.6 to 2.4.9	Chapter 2: Engineering functions	Textbook Exercises 2.3, 2.4.1, 2.4.2, 2.4.6, 2.4.8, 2.4.9 and Week 3 Tutorial Exercises

**Week 4 - 01 Apr 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 2.4.3 to 2.4.5	Chapter 2: Engineering functions	Textbook Exercises 2.4.3, 2.4.4, 2.4.5 and Week 4 Tutorial Exercises

**Week 5 - 08 Apr 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 3.1 to 3.8	Chapter 3: The trigonometric functions	Textbook Exercises 3.3, 3.4, 3.6 to 3.8 and Week 5 Tutorial Exercises  <b>Assignment 1</b> Due: Week 5 Friday (12 Apr 2019) 5:00 pm AEST

**Vacation Week - 15 Apr 2019**

Module/Topic	Chapter	Events and Submissions/Topic
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**Week 6 - 22 Apr 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 4.1 to 4.4, 7.1 to 7.7	Chapter 4: Coordinate systems, and Chapter 7: Vectors	Textbook Exercises 4.2 to 4.4, 7.2, 7.3, 7.5 to 7.7 and Week 6 Tutorial Exercises

**Week 7 - 29 Apr 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 9.1 to 9.9	Chapter 9: Complex numbers	Textbook Exercises 9.2 to 9.5, 9.7, 9.9 and Week 7 Tutorial Exercises

**Week 8 - 06 May 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 8.1 to 8.8	Chapter 8: Matrix algebra	Textbook Exercises 8.3, 8.5, 8.6, 8.7, 8.8 and Week 8 Tutorial Exercises

**Week 9 - 13 May 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 8.9 to 8.13	Chapter 8: Matrix algebra	Textbook Exercises 8.9 to 8.11, 8.13 and Week 9 Tutorial Exercises  <b>Assignment 2</b> Due: Week 9 Friday (17 May 2019) 5:00 pm AEST

**Week 10 - 20 May 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 28.1 to 28.4, 28.6 to 28.7, 29.1 to 29.5	Chapter 28: Probability, and Chapter 29: Statistics and probability distributions	Textbook Exercises 28.2 to 28.4, 28.6-28.7, 29.2, 29.3, 29.5 and Week 10 Tutorial Exercises

**Week 11 - 27 May 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Textbook Sections 29.6 to 29.15	Chapter 29: Statistics and probability distributions	Textbook Exercises 29.6 to 29.15 and Week 11 Tutorial Exercises

**Week 12 - 03 Jun 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Revision		Revision and Week 12 Tutorial Exercises

**Review/Exam Week - 10 Jun 2019**

Module/Topic	Chapter	Events and Submissions/Topic
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**Exam Week - 17 Jun 2019**

Module/Topic	Chapter	Events and Submissions/Topic
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## Term Specific Information

To receive a Pass grade, or above, in the MATH11218 unit you must obtain:

- (1) at least 50% of marks on the final examination; AND
- (2) at least 50% on the combined total result for the two assignments and the exam.

Each of the two assignments has a 20% weighting contribution towards the final unit result. The final examination has a 60% weighting contribution to the final unit result. More details on each of the assessments can be found on the course Moodle site under the respective assessment blocks.

## Assessment Tasks

### 1 Assignment 1

#### Assessment Type

Written Assessment

#### Task Description

Please see the unit Moodle site for the questions in this assignment. Questions are from the unit content covered 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 Friday (12 Apr 2019) 5:00 pm AEST

#### Return Date to Students

Week 7 Friday (3 May 2019)

Usually within two weeks of the due date; through the unit Moodle site.

#### Weighting

20%

#### Assessment Criteria

Questions are from unit content covered in Weeks 1-4. Questions are awarded full marks if they are error-free, partial marks if there are some errors, 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 20%. Answers to all questions should be neatly and clearly presented. Full working is required to obtain maximum credit for solutions.

#### Referencing Style

- [Harvard \(author-date\)](#)

#### Submission

Online

#### Submission Instructions

Assignment 1 is uploaded as a single document at the unit Moodle site for MATH11218. Full details are provided on the unit Moodle site.

#### Learning Outcomes Assessed

- Solve problems by applying the properties of linear, quadratic, logarithmic and exponential functions
- Communicate results, concepts and ideas in context using mathematics as a language
- Apply mathematical software to visualise, analyse, validate and solve problems.

#### Graduate Attributes

- Communication
- Problem Solving
- Information Technology Competence
- Ethical practice

## 2 Assignment 2

### Assessment Type

Written Assessment

### Task Description

Please see the unit Moodle site for the questions in this assignment. Questions are from the unit content covered in Weeks 5-8. Assignment 2 will be available for download under the "Assessment" block on the unit Moodle website, 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 9 Friday (17 May 2019) 5:00 pm AEST

### Return Date to Students

Week 11 Friday (31 May 2019)

Usually within two weeks of the due date; through the unit Moodle site.

### Weighting

20%

### Assessment Criteria

Questions are from unit content covered in Weeks 5-8. Questions are awarded full marks if they are error-free, partial marks if there are some errors, and no marks if not attempted or contain so many errors as to render the attempt to be without value. The final Assignment 2 mark is scaled to an assessment weighting out of 20%. Answers to all questions should be neatly and clearly presented. Full working is required to obtain maximum credit for solutions.

### Referencing Style

- [Harvard \(author-date\)](#)

### Submission

Online

### Submission Instructions

Assignment 2 is uploaded as a single document at the unit Moodle site for MATH11218. Full details are provided on the unit Moodle site.

### Learning Outcomes Assessed

- Model periodic phenomena using trigonometric functions and apply trigonometry to solve triangles
- Use complex numbers, vectors and matrix algebra to develop solutions to problems
- Communicate results, concepts and ideas in context using mathematics as a language
- Apply mathematical software to visualise, analyse, validate and solve problems.

### Graduate Attributes

- Communication
- Problem Solving
- Information Technology Competence
- Ethical practice

## Examination

### Outline

Complete an invigilated examination.

### Date

During the examination period at a CQUniversity examination centre.

### Weighting

60%

### 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

## 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