MATH11160 *Technology Mathematics*

Term 1 - 2017

Profile information current as at 05/05/2024 08:43 am

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 students apply essential mathematical concepts, processes and techniques to support the development of mathematical descriptions and models for engineering problems. They investigate and apply the properties of linear, quadratic, exponential and logarithmic functions in appropriate settings, use trigonometric functions to solve triangles and describe periodic phenomena and use vector and matrix algrebra to solve problems in an engineering context. Concepts of elementary statistics to organise and analyse data are covered. Students select appropriate mathematical methods appreciating the importance of underlying assumptions and then use them to investigate and solve problems, and interpret the results. Other important elements of this unit are the communication of results, concepts and ideas using mathematics as a language, being able to document the solution to problems in a way that demonstrates a clear, logical and precise approach and communicating, working and learning in peer learning teams where appropriate. Distance education (FLEX) students are required to have significant access to a computer and make frequent use of the internet.

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

There are no requisites for this unit.
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 - 2017

- Distance
- 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. **Written Assessment**
Weighting: 10%
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 Evaluation

Feedback

2 weeks to learn Calculus is too short

Recommendation

Actually we have 3 weeks for calculus. I suggest to discuss the possibility of changing the structure of this course in the future.

Action

Not yet approved

Unit Learning Outcomes

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

1. apply essential functions and trigonometric, statistical and matrix concepts, processes and techniques to support the development of mathematical descriptions and models for engineering problems
2. investigate and apply the properties of linear, quadratic, exponential and logarithmic functions in appropriate settings
3. use trigonometric functions to solve triangles and describe periodic phenomena
4. use vector and matrix algebra to solve problems in an engineering context
5. organise and analyse data using the concepts of elementary statistics
6. select appropriate mathematical methods appreciating the importance of underlying assumptions, use them to investigate and solve engineering problems, and interpret the results
7. use mathematics as a language to communicate results, concepts and ideas in context
8. document the solution to problems in a way that demonstrates a clear, logical and precise approach
9. communicate, work and learn together in peer learning teams where appropriate.

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	6	7	8	9
1 - Written Assessment - 25%	•	•	•			•	•	•	
2 - Written Assessment - 25%	•	•	•	•		•	•	•	
3 - Written Assessment - 10%	•	•	•	•	•		•	•	•
4 - Examination - 40%	•	•	•	•	•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes								
	1	2	3	4	5	6	7	8	9
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 - 25%	•	•	•	•		•		•		
2 - Written Assessment - 25%	•	•	•	•		•		•		
3 - Written Assessment - 10%	•	•	•	•	•	•		•		
4 - Examination - 40%	•	•	•	•		•		•		

Textbooks and Resources

Textbooks

MATH11160

Prescribed

Basic Technical Mathematics with Calculus (SI Version)
Edition: 10th edn (2014)
Authors: Washington, AJ
Pearson Canada
Toronto , ON , Canada
ISBN: 9780132762830
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)

Referencing Style

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

Teaching Contacts

Yucang Wang Unit Coordinator
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Schedule

Week 1 - 06 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Basic Algebraic Operations	Study Guide: Module 1; Textbook: 1.1-1.12	Diagnostic quiz

Week 2 - 13 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Geometry & the Trigonometric Functions	Study Guide: Module 2; Textbook: 2.1-2.4, 2.6, 4.2-4.5, 8.1-8.4	

Week 3 - 20 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Functions, Graphs, & Inequalities	Study Guide: Module 3; Textbook: 3.1-3.4, 5.1, 5.2, 21.1, 21.2, 17.1, 17.2, 17.4	

Week 4 - 27 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Factoring, Quadratic Functions, & Fractions	Study Guide: Module 4; Textbook: 6.1-6.3, 7.1-7.4, 6.5-6.8	

Week 5 - 03 Apr 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Vectors & Oblique Triangles	Study Guide: Module 5; Textbook: 9.1-9.6	**Assignment 1** Due: Week 5 Wednesday (5 Apr 2017) 9:00 pm AEST
Vacation Week - 10 Apr 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Week 6 - 17 Apr 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Ratio, Proportion, & Graphs of Trigonometric Functions	Study Guide: Module 6; Textbook: 18.1, 18.2, 10.1-10.3	Diagnostic quiz
Week 7 - 24 Apr 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Exponential & Logarithmic Functions	Study Guide: Module 7; Textbook: 11.1, 11.2, 13.1-13.6	
Week 8 - 01 May 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Systems of Linear Equations, Determinants, & Matrices	Study Guide: Module 8; Textbook: 5.3-5.5, 16.1-16.4	
Week 9 - 08 May 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
The Derivative	Study Guide: Module 9; Textbook: 23.1-23.7	Diagnostic quiz **Assignment 2** Due: Week 9 Wednesday (10 May 2017) 5:00 pm AEST
Week 10 - 15 May 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
The Derivative; Applications of the Derivative	Study Guide: Module 10; Textbook: 23.9, 24.1, 24.7	
Week 11 - 22 May 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Integration; Applications of Integration	Study Guide: Module 11; Textbook: 25.1, 25.2, 25.4, 26.1, 26.6	
Week 12 - 29 May 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Introduction to Statistics	Study Guide: Module 12; Textbook: 22.1-22.4	**Assignment 3** Due: Week 12 Wednesday (31 May 2017) 5:00 pm AEST
Review/Exam Week - 05 Jun 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Unit Review		Diagnostic quiz
Exam Week - 12 Jun 2017		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Assessment Tasks

1 Assignment 1

Assessment Type
Written Assessment

Task Description
This assignment has 25 mathematical questions from the first 4 weeks of the unit and will form part of a folio of worked mathematical examples that can be used as a reference for study.
The assignment questions are available from the term 1 2017 Moodle unit website. Follow the instructions and work your solutions carefully. Remember to check your answers.

Assessment Due Date
Week 5 Wednesday (5 Apr 2017) 9:00 pm AEST

Return Date to Students
Week 7 Wednesday (26 Apr 2017)

Weighting
25%

Assessment Criteria
Each question is worth 1 mark and the final marks are out of 25. All working should be shown to get part or full marks.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit according to the online submission instructions in Moodle.

Learning Outcomes Assessed

- apply essential functions and trigonometric, statistical and matrix concepts, processes and techniques to support the development of mathematical descriptions and models for engineering problems
- investigate and apply the properties of linear, quadratic, exponential and logarithmic functions in appropriate settings
- use trigonometric functions to solve triangles and describe periodic phenomena
- select appropriate mathematical methods appreciating the importance of underlying assumptions, use them to investigate and solve engineering problems, and interpret the results
- use mathematics as a language to communicate results, concepts and ideas in context
- document the solution to problems in a way that demonstrates a clear, logical and precise approach

Graduate Attributes

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

2 Assignment 2

Assessment Type
Written Assessment

Task Description
This assignment has 25 questions and creates a folio of worked examples that can be used as a reference for study covering weeks 5-8 of the unit.
Each question is worth 1 mark and the final marks are out of 25. All working should be shown to get part or full marks.
Check the term 1 2017 Unit Website in Moodle for the questions. Follow the instructions carefully.

Assessment Due Date
Week 9 Wednesday (10 May 2017) 5:00 pm AEST

Return Date to Students
Week 11 Wednesday (24 May 2017)

Weighting
25%

Assessment Criteria
Each question is worth 1 mark and the final marks are out of 25. All working should be shown to get part or full marks.

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- apply essential functions and trigonometric, statistical and matrix concepts, processes and techniques to support the development of mathematical descriptions and models for engineering problems
- investigate and apply the properties of linear, quadratic, exponential and logarithmic functions in appropriate settings
- use trigonometric functions to solve triangles and describe periodic phenomena
- use vector and matrix algebra to solve problems in an engineering context
- select appropriate mathematical methods appreciating the importance of underlying assumptions, use them to investigate and solve engineering problems, and interpret the results
- use mathematics as a language to communicate results, concepts and ideas in context
- document the solution to problems in a way that demonstrates a clear, logical and precise approach

Graduate Attributes

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

3 Assignment 3

Assessment Type
Written Assessment

Task Description
This assignment has 10 questions and creates a folio of worked examples that can be used as a reference for study covering work from weeks 9 to 11 of the unit.
Check the term 1 2017 Unit Website in Moodle for the questions. Follow the instructions carefully.

Assessment Due Date
Week 12 Wednesday (31 May 2017) 5:00 pm AEST

Return Date to Students
Review/Exam Week Wednesday (7 June 2017)

Weighting
10%

Assessment Criteria
Each question is worth 1 mark and the final marks are out of 10. All working should be shown to get part or full marks.

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- apply essential functions and trigonometric, statistical and matrix concepts, processes and techniques to support the development of mathematical descriptions and models for engineering problems
- investigate and apply the properties of linear, quadratic, exponential and logarithmic functions in appropriate settings
- use trigonometric functions to solve triangles and describe periodic phenomena
- use vector and matrix algebra to solve problems in an engineering context

- organise and analyse data using the concepts of elementary statistics
- use mathematics as a language to communicate results, concepts and ideas in context
- document the solution to problems in a way that demonstrates a clear, logical and precise approach
- communicate, work and learn together in peer learning teams where appropriate.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Ethical practice

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
40%

Exam Conditions
Open Book.

Materials
Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised
Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

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