



MATH1000

Introduction to Mathematical Modelling

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Mathematical and Physical Sciences

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General Information

Unit convenor and teaching staff

Unit Convener

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By appointment

Lecturer

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Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

This unit is an elementary unit designed for Engineering, Mathematics and Physics students whose mathematics background has not met the recommended standard for students entering these programs. One half of the unit provides an introduction to the ideas and techniques of differentiation and integration which are pervasive in the theoretical and practical models that underpin areas of science, engineering, economics and technology. The other half of the unit develops the algebraic skills and techniques including exponential, logarithmic, and trigonometric functions.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

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

ULO1: Perform calculations, including rates of changes and integrals, of elementary functions used in science and economics (including linear, polynomial, exponential, logarithmic, and trigonometric) and interpret results of these calculations.

ULO2: Communicate mathematical concepts, pertaining to foundation level science topics, in a variety of forms including graphically, numerically, in writing and by using equations.

ULO3: Apply mathematical reasoning to simple problem solving in the context of elementary algebra and calculus.

ULO4: Test mathematical conjectures involving elementary functions.

ULO5: Demonstrate foundational learning skills including active engagement in the learning process.

ULO6: Create, communicate and interpret the content of mathematical models relevant to foundation level science topics.

General Assessment Information

Requirements to Pass this Unit

To pass this unit you need to achieve a total mark equal to or greater than 50%.

Attendance and participation

We strongly encourage all students to actively participate in all learning activities. Regular engagement is crucial for your success in this unit, as these activities provide opportunities to deepen your understanding of the material, collaborate with peers, and receive valuable feedback from instructors, to assist in completing the unit assessments. Your active participation not only enhances your own learning experience but also contributes to a vibrant and dynamic learning environment for everyone.

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience technical concerns. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#). For example, if the assignment is worth 8 marks (of the entire unit) and your submission is late by 19 hours (or 23 hours 59 minutes 59 seconds), 0.4 marks (5% of 8 marks) will be deducted. If your submission is late by 24 hours (or 47 hours 59 minutes 59 seconds), 0.8 marks (10% of 8 marks) will be deducted, and so on.

Assessments where Late Submissions will be accepted

- **Assignment** – YES, Standard Late Penalty applies
- **Online module exercises** - NO, unless Special Consideration is granted
- **Final examination** - NO, unless Special Consideration is granted

Incorrectly submitted work

When submitting work, ensure the correct work is submitted. For example, ensure that not only the first page of a submission is uploaded. Penalties apply when a corrected document is uploaded.

Special Consideration and Short Extensions

Special Consideration

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through <http://connect.mq.edu.au/>.

Written Assessments/Quizzes/Tests: If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through <https://connect.mq.edu.au>.

Short Extensions

For online module exercises and assignments, students are allowed to request an extra 3 calendar days to complete eligible assessments. No reason or evidence is required.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Online module exercises	50%	No	08/11/2026	Individual	Yes	Open
Assignment	24%	No	25/10/2026	Individual	Yes	Open
Final examination	26%	No	Exam period	Individual	No	Observed

Online module exercises

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 40 hours

Due: **08/11/2026**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

In the online exercises the student will demonstrate mastery of skills and techniques in the module work at the pass and credit level.

On successful completion you will be able to:

- Perform calculations, including rates of changes and integrals, of elementary functions used in science and economics (including linear, polynomial, exponential, logarithmic, and trigonometric) and interpret results of these calculations.
- Apply mathematical reasoning to simple problem solving in the context of elementary algebra and calculus.
- Test mathematical conjectures involving elementary functions.
- Demonstrate foundational learning skills including active engagement in the learning process.

Assignment

Assessment Type ¹: Problem-based task

Indicative Time on Task ²: 15 hours

Due: **25/10/2026**

Weighting: **24%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The assignment will test the ability of students to solve mathematical problems using concepts and techniques learnt in the unit.

On successful completion you will be able to:

- Perform calculations, including rates of changes and integrals, of elementary functions used in science and economics (including linear, polynomial, exponential, logarithmic, and trigonometric) and interpret results of these calculations.
- Communicate mathematical concepts, pertaining to foundation level science topics, in a variety of forms including graphically, numerically, in writing and by using equations.
- Apply mathematical reasoning to simple problem solving in the context of elementary algebra and calculus.
- Test mathematical conjectures involving elementary functions.
- Demonstrate foundational learning skills including active engagement in the learning process.
- Create, communicate and interpret the content of mathematical models relevant to

foundation level science topics.

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **Exam period**

Weighting: **26%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

The exam will test the ability of students to utilize concepts and techniques learnt in the unit at the distinction and high distinction level.

On successful completion you will be able to:

- Perform calculations, including rates of changes and integrals, of elementary functions used in science and economics (including linear, polynomial, exponential, logarithmic, and trigonometric) and interpret results of these calculations.
- Communicate mathematical concepts, pertaining to foundation level science topics, in a variety of forms including graphically, numerically, in writing and by using equations.
- Apply mathematical reasoning to simple problem solving in the context of elementary algebra and calculus.
- Test mathematical conjectures involving elementary functions.
- Demonstrate foundational learning skills including active engagement in the learning process.
- Create, communicate and interpret the content of mathematical models relevant to foundation level science topics.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- [Academic Success](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

Classes

- Lectures (beginning in Week 1): There are two 1-hour lectures each week.
- SGTA classes (beginning in Week 1). There is one two-hour SGTA each week.

The timetable for classes can be found on the University website at <https://publish.mq.edu.au/>.

Enrolment can be managed using eStudent at <https://students.mq.edu.au/support/technology/systems/estudent>

Suggested textbooks

No single book covers the content of MATH1000 precisely. Each of the following books contains material useful and relevant to the unit.

- * Boelkins, Matthew Active Prelude to Calculus <https://activecalculus.org/prelude/book-1.html>
- * Boelkins, Matthew Active Calculus <https://activecalculus.org/single/book-1.html>
- * Hughes-Hallett, Deborah Calculus Seventh edition (or any other edition) Available online through the library

Methods of Communication

We will communicate with you via your university email or through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to your lecturers from your university email address.

Unit Schedule

Module 1 (Weeks 1-2)

- Sets
- Algebra skills
- Proportionality

Module 2 (Weeks 3-4)

- Common functions
- Domain and range
- Transformations
- Compositions
- Linear functions
- Quadratics
- Polynomials Inequalities

Module 3 (Weeks 5-6)

- Degrees and radians
- Unit circle definition
- Special triangles
- Trig functions
- Inverse trig functions
- Applications

Module 4 (Weeks 7-8)

- Rates of change
- Derivative rules
- The second derivative
- Curve sketching
- Applications

Module 5 (Weeks 9-10)

- Exponentials
- Logarithms
- Series and Sequences
- Applications

Module 6 (Weeks 11-12)

- Numerical integration
- Fundamental theorem of calculus
- Integration by substitution
- Applications

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)

- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Unit information based on version 2026.01R of the [Handbook](#)