



# MATH1378

## Modelling and Communication in Mathematics

Session 2, Special circumstance 2020

*Department of Mathematics and Statistics*

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#### Disclaimer

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#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Lecturer/Convener

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12 Wally's Walk 714

See iLearn page

Lecturer/Convener

Maurizio Manuguerra

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Credit points

10

Prerequisites

MATH1015

Corequisites

Co-badged status

Unit description

This unit introduces students to computational strategies and programming techniques relevant to the mathematical sciences. This unit covers the basics of a high-level programming language, including the use of functions, conditional statements, and loops. These basic ideas will then be used to formulate and implement computational algorithms for solving mathematical problems. This unit will also introduce mathematical typesetting software that is capable of appropriately presenting mathematical results. Students who have completed this unit will be able to use appropriate software tools to solve complex mathematical problems and to effectively communicate mathematical results.

## 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:** Express mathematical objects in terms of computational code and data structures.
- ULO2:** Analyse mathematical and statistical problems and identify computational strategies for solving them.
- ULO3:** Implement coding strategies in a high-level programming language to solve mathematical and statistical problems.
- ULO4:** Identify and utilise the existing tools offered by a high-level programming language to address specific mathematical and statistical challenges.
- ULO5:** Communicate mathematical and statistical ideas and results effectively in a range of contexts, using appropriate software tools.

## General Assessment Information

**HURDLES:** This unit has no hurdle requirements.

**ASSIGNMENT SUBMISSION:** Assignment submission will be online through the iLearn page.

Submit assignments online via the appropriate assignment link on the iLearn page. A personalised cover sheet is not required with online submissions. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration.

- Assignment submission is via iLearn.
- Please note the quick guide on how to upload your assignments provided on the iLearn page.
- If there are technical obstructions to your submitting online, please email us to let us know.

You may submit as often as required prior to the due date/time. Please note that each submission will completely replace any previous submissions. It is in your interests to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

**LATE SUBMISSION:** All assignments must be submitted by the official due date and time. No marks will be given for late work unless an extension has been granted following a successful application for Special Consideration. Please contact one of the unit convenors for advice as soon as you become aware that you may have difficulty meeting any of the assignment deadlines. It is in your interests to make frequent submissions of your partially completed work. Note that later submissions completely replace any earlier submission, and so only the final submission made before the due date will be marked.

**FINAL EXAM POLICY:** There is no final exam for this unit.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Problem Set 1</a>	15%	No	Week 4
<a href="#">Problem Set 2</a>	15%	No	Week 10
<a href="#">Project 1</a>	35%	No	Week 8
<a href="#">Project 2</a>	35%	No	Week 13

### Problem Set 1

Assessment Type [1](#): Problem set

Indicative Time on Task [2](#): 10 hours

Due: **Week 4**

Weighting: **15%**

These problems will test the ability of students to use mathematical software to analyse provided problems, and express the results using mathematical typesetting.

On successful completion you will be able to:

- Express mathematical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify computational strategies for solving them.
- Implement coding strategies in a high-level programming language to solve mathematical and statistical problems.
- Identify and utilise the existing tools offered by a high-level programming language to address specific mathematical and statistical challenges.
- Communicate mathematical and statistical ideas and results effectively in a range of contexts, using appropriate software tools.

### Problem Set 2

Assessment Type [1](#): Problem set

Indicative Time on Task [2](#): 10 hours

Due: **Week 10**

Weighting: **15%**

These problems will test the ability of students to use statistical software to analyse provided problems, and express the results using mathematical typesetting.

On successful completion you will be able to:

- Express mathematical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify computational strategies for solving them.
- Implement coding strategies in a high-level programming language to solve mathematical and statistical problems.
- Identify and utilise the existing tools offered by a high-level programming language to address specific mathematical and statistical challenges.
- Communicate mathematical and statistical ideas and results effectively in a range of contexts, using appropriate software tools.

## Project 1

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 8**

Weighting: **35%**

The students will be assigned a mathematical problem. They will be required to study this problem using appropriate computational techniques implemented in mathematical software. The students will be required to produce a written report and typeset it appropriately.

On successful completion you will be able to:

- Express mathematical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify computational strategies for solving them.
- Implement coding strategies in a high-level programming language to solve mathematical and statistical problems.
- Identify and utilise the existing tools offered by a high-level programming language to address specific mathematical and statistical challenges.
- Communicate mathematical and statistical ideas and results effectively in a range of contexts, using appropriate software tools.

## Project 2

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 13**

Weighting: **35%**

The students will be assigned a statistical problem. They will be required to study this problem using appropriate computational techniques implemented in statistical software. The students will be required to produce a written report and typeset it appropriately.

On successful completion you will be able to:

- Express mathematical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify computational strategies for solving them.
- Implement coding strategies in a high-level programming language to solve mathematical and statistical problems.
- Identify and utilise the existing tools offered by a high-level programming language to address specific mathematical and statistical challenges.
- Communicate mathematical and statistical ideas and results effectively in a range of contexts, using appropriate software tools.

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<sup>1</sup> 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
- the [Writing Centre](#) for academic skills support.

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

## Delivery and Resources

### Lectures and Small Group Teaching Activities:

Each week will have one one-hour lecture covering the course material.

Each week will have one two-hour SGTA.

The unit material consists of notes and videos that will be distributed on iLearn.

## Required Materials:

This subject requires the use of the following computer software:

- **Matlab:** Macquarie University provides Matlab access on a wide range of computing platforms. Access and installation instructions may be found at: <https://staff.mq.edu.au/intranet/science-and-engineering/services-and-resources/it-support-services/miscellaneous/matlab>
- **LaTeX:** LaTeX is a free mathematical typesetting program. Access and installation instructions may be found at: <https://www.latex-project.org/get/>
  - Students may also use the free online LaTeX compiler, Overleaf, which is found at: <https://www.overleaf.com>
- **R:** R is a free statistical software package. Access and installation instructions may be found at: <https://www.r-project.org/>
- **RStudio:** RStudio is an open source tool that is used to manage and present work performed using R. Access and installation instructions may be found at <https://rstudio.com/products/rstudio/download/>

Students are invited to bring their own devices (BYOD). Acceptable platforms are Windows, Linux and Mac. For students choosing to participate in face-to-face activities, a laptop is recommended. If students do not have a suitable machine, they are invited to contact the teaching staff as soon as possible.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). 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](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you

need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/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 [ask.mq.edu.au](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Student Support

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

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [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

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)



## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

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.