STAT1378
Coding and Communication in Statistics
Session 2, Special circumstances 2021
Department of Mathematics and Statistics

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Notice
Some on-campus classes have moved online for the first two weeks of Session, before returning to campus in Week 3. If you are studying a unit outside of the primary Session 2 timetable, please contact your teaching staff team for further details.

Some classes/teaching activities cannot be moved online and must be taught on campus. To find out if you are enrolled in one of these classes/teaching activities, you can check to see if your unit is on the list of units with mandatory on-campus classes/teaching activities.

Your Unit Convenor will provide more information via an iLearn announcement when your iLearn unit becomes available.
Unit convenor and teaching staff
Unit Convenor & Lecturer
Thomas Fung
thomas.fung@mq.edu.au
Contact via Email
Room 6.26, 12 Wally's Walk
See iLearn

Credit points
10

Prerequisites
STAT1371 or STAT171 or STAT1170 or STAT170 or FOSE1015 or FOSX1015

Co-requisites

Co-badged status

Unit description
Professional statistical work is often a mixture of statistical modelling, programming and results' communication. This unit addresses the methods and the tools required to perform this job introducing students to state-of-the-art programming languages used to solve Statistical problems and communicate Statistical results. The unit is very practical, with classes and assessment mostly held in a computer lab. Students who have completed this unit will be able to use appropriate software tools to solve complex statistical problems and to effectively communicate their results.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

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

ULO1: Express mathematical and statistical objects in terms of computational code and data structures.
ULO2: Analyse mathematical and statistical problems and identify language-agnostic computational strategies for solving them.
ULO3: Implement computational strategies in a high-level programming language to
solve mathematical and statistical problems.

**ULO4:** Evaluate and solve specific mathematical and statistical challenges by identifying and utilising the existing tools offered by high-level programming languages.

**ULO5:** Communicate effectively and in a range of contexts mathematical and statistical ideas and results, using appropriate software tools.

**ULO6:** Demonstrate foundational learning skills including active engagement in their learning process.

**General Assessment Information**

**HURDLES:** Attendance at, and reasonable engagement in, Small Group Teaching Activities (SGTA) in this unit is **compulsory.** Attendance and reasonable engagement in the class activities in at least 10 out of 12 of the classes are requirements to pass the unit. This is a hurdle requirement.

**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 submission 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 interest 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

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation to SGTA classes</td>
<td>0%</td>
<td>Yes</td>
<td>Weekly</td>
</tr>
<tr>
<td>Problem Set 1</td>
<td>15%</td>
<td>No</td>
<td>Week 5</td>
</tr>
<tr>
<td>Problem Set 2</td>
<td>15%</td>
<td>No</td>
<td>Week 10</td>
</tr>
<tr>
<td>Project</td>
<td>35%</td>
<td>No</td>
<td>Week 13</td>
</tr>
<tr>
<td>Presentation</td>
<td>35%</td>
<td>No</td>
<td>Week 13</td>
</tr>
</tbody>
</table>

Participation to SGTA classes
Assessment Type 1: Participatory task
Indicative Time on Task 2: 0 hours
Due: Weekly
Weighting: 0%
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Students must attend and participate in at least 10 of the weekly SGTA classes to pass this unit. This is a hurdle requirement.

On successful completion you will be able to:
• Demonstrate foundational learning skills including active engagement in their learning process.

Problem Set 1
Assessment Type 1: Problem set
Indicative Time on Task 2: 10 hours
Due: Week 5
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 and statistical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify language-agnostic computational strategies for solving them.
- Implement computational strategies in a high-level programming language to solve mathematical and statistical problems.
- Evaluate and solve specific mathematical and statistical challenges by identifying and utilising the existing tools offered by high-level programming languages.
- Communicate effectively and in a range of contexts mathematical and statistical ideas and results, 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 and statistical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify language-agnostic computational strategies for solving them.
- Implement computational strategies in a high-level programming language to solve mathematical and statistical problems.
- Evaluate and solve specific mathematical and statistical challenges by identifying and utilising the existing tools offered by high-level programming languages.
- Communicate effectively and in a range of contexts mathematical and statistical ideas and results, using appropriate software tools.

Project

Assessment Type 1: Project
Indicative Time on Task 2: 20 hours
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 and statistical objects in terms of computational code and data structures.
- Analyse mathematical and statistical problems and identify language-agnostic computational strategies for solving them.
- Implement computational strategies in a high-level programming language to solve mathematical and statistical problems.
- Evaluate and solve specific mathematical and statistical challenges by identifying and utilising the existing tools offered by high-level programming languages.
- Communicate effectively and in a range of contexts mathematical and statistical ideas and results, using appropriate software tools.

**Presentation**

Assessment Type: Presentation
Indicative Time on Task: 20 hours
Due: Week 13
Weighting: 35%

The students will be asked to present the solution to a statistical problem in a specific format.

On successful completion you will be able to:

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

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
• the Learning Skills Unit 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

Delivery and Resources

Lectures and Small Group Teaching Activities:
There are no formal lectures scheduled for this unit. Each week we will have some video recordings 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:

• **R**: R is a free statistical software package. Access and installation instructions may be found at: [https://www.r-project.org/](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/](https://rstudio.com/products/rstudio/download/)

• **LaTeX**: LaTeX is a free mathematical typesetting program. Access and installation instructions may be found at: [https://www.latex-project.org/get/](https://www.latex-project.org/get/)

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.

Unit Schedule
This is a draft schedule and is subjected to change.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Basics</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Flow Control</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Introduction to Tidyverse and ggplot2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Introduction to Iteration</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Writing R Packages</td>
<td>Problem Set 1 due</td>
</tr>
<tr>
<td>6</td>
<td>Version Control with git and Github</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Introduction to RMarkdown</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Session 2 Break</strong></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Introduction to LaTeX Part I</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Introduction to LaTeX Part II</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Reproducible Report</td>
<td>Problem Set 2 due</td>
</tr>
<tr>
<td>11</td>
<td>Markdown Presentation</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>No Lecture</td>
<td>Project due</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presentation due</td>
</tr>
</tbody>
</table>

### 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). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central)
- [Academic Integrity Policy](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central)
- [Fitness to Practice Procedure](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central)

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[https://unitguides.mq.edu.au/unit_offerings/136342/unit_guide/print](https://unitguides.mq.edu.au/unit_offerings/136342/unit_guide/print)
Students seeking more policy resources can visit the 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 (https://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/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 ask.mq.edu.au or if you are a Global MBA student contact 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) 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 Enquiry Service**

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au
Equity 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.

IT Help

For help with University computer systems and technology, visit 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.

Changes from Previous Offering

This unit is no longer co-taught with MATH1378. Unit content and assessment plan were updated to reflect that.