



STAT6102

Graphics, Multivariate Methods and Data Mining

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

Lecturer, Unit Convenor

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Lecturer

Dr Tess O'Brien

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Credit points

10

Prerequisites

STAT6170

Corequisites

STAT6180

Co-badged status

STAT3102

Unit description

This unit introduces statistical tools for multivariate data analysis such as statistical graphics, discriminant analysis, principal component analysis, cluster analysis and an introduction to data mining, especially classification. Statistical packages are used extensively to illustrate the concepts.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Good Health and Well Being; Quality Education; Industry, Innovation and Infrastructure;

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: Interpret and apply principles underlying statistical data visualisation, multivariate methods and data mining to problems arising from diverse fields of research.

ULO2: Choose appropriate graphical techniques for displaying data.

ULO3: Choose the appropriate statistical analysis, for a given data set, from a wide range of methods based on multivariate methods and data mining.

ULO4: Use a statistical computer package to carry out chosen analyses and interpret the results; present the results of analyses in a form which is suitable for technical report or publication.

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% across all assessments

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.

Assignment Submission

Assignment submission will be online through the iLearn page. Your name and Student ID should appear on the first 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 make sure that your assignment is word processed.
- You should upload one single PDF file.
- 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 best interest to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

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
- Practical Test - No, unless Special Consideration is Granted

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/>.

If granted a successful second special consideration for the Assignment you will be given a new assessment with 2 weeks to complete it in. The Unit Convenor will email this assessment along with dataset/s to your student email address.

[Short Extensions](#)

- Assignment - YES, Short Extension applies
- Practical Test - NO, Short Extension does not apply

For assessment for which a Short Extension applies, students are allowed to request an extra 3 calendar days to complete the eligible assessment. No reason or evidence is required. The request must be made before the assessment due date.

RELEASE

- Assignment: To be released no later than 28 August 2026

FINAL EXAM POLICY

It is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period. The only excuse for not sitting an examination at the designated time is because of documented illness or unavoidable

disruption. In these special circumstances, you may apply for special consideration via ask.mq.edu.au.

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during this supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application.

You can check the supplementary exam information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

If granted a second special consideration for the Assignment you will be given a new assessment with 2 weeks to complete it in.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Final Exam	50%	No	Examination Period	Individual	No	Observed
Assignment	25%	No	11/09/2026	Individual	Yes	Open
Practical Test	25%	No	In week 11, during the SGTA in which you are registered.	Individual	No	Observed

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **Examination Period**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will undertake a final examination during the formal examination period.

On successful completion you will be able to:

- Interpret and apply principles underlying statistical data visualisation, multivariate methods and data mining to problems arising from diverse fields of research.
- Choose appropriate graphical techniques for displaying data.

- Choose the appropriate statistical analysis, for a given data set, from a wide range of methods based on multivariate methods and data mining.
- Use a statistical computer package to carry out chosen analyses and interpret the results; present the results of analyses in a form which is suitable for technical report or publication.

Assignment

Assessment Type ¹: Problem-based task

Indicative Time on Task ²: 15 hours

Due: **11/09/2026**

Weighting: **25%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

Reinforce and apply the concepts covered in lectures and the skills learnt in SGTAs, through data analysis and critical thinking.

On successful completion you will be able to:

- Interpret and apply principles underlying statistical data visualisation, multivariate methods and data mining to problems arising from diverse fields of research.
- Choose appropriate graphical techniques for displaying data.
- Choose the appropriate statistical analysis, for a given data set, from a wide range of methods based on multivariate methods and data mining.
- Use a statistical computer package to carry out chosen analyses and interpret the results; present the results of analyses in a form which is suitable for technical report or publication.

Practical Test

Assessment Type ¹: Experiential task

Indicative Time on Task ²: 15 hours

Due: **In week 11, during the SGTA in which you are registered.**

Weighting: **25%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

This is an open book style practical test. The practical test is designed to examine the use of software for data analysis and the software output interpretation skills taught in the unit.

On successful completion you will be able to:

- Interpret and apply principles underlying statistical data visualisation, multivariate methods and data mining to problems arising from diverse fields of research.
 - Choose appropriate graphical techniques for displaying data.
 - Choose the appropriate statistical analysis, for a given data set, from a wide range of methods based on multivariate methods and data mining.
 - Use a statistical computer package to carry out chosen analyses and interpret the results; present the results of analyses in a form which is suitable for technical report or publication.
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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

Week 1 classes

There is a 1 hour lecture in Week 1.

Delivery

There is a 1 hour lecture and a 2 hour SGTA each week. SGTAs begin in Week 2. Please consult the timetable for the scheduling of these activities. 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>.

In addition to the one hour lecture there are online resources including videos which should be viewed prior to the lecture.

Technologies used and required

Lecture material will be placed on iLearn. The statistical package R will be used.

SGTA

SGTAs are held in computing labs and allow you to practice techniques learnt in lectures and from above mentioned online resources.

Text book

There is no prescribed textbook for this unit.

Recommended texts

Weeks 1-6 Material

- Chambers J M et al (1983) *Graphical Methods for Data Analysis*.
- Cleveland W S (1994) *Elements of Graphing Data*.
- Cleveland W S & McGill M E (1988) *Dynamic Graphics for Statistics*.
- Du Toit S H C et al (1986) *Graphical Exploratory Data Analysis*.
- Ehrenberg A S C (1982) *Primer in Data Reduction*.
- Tufte E R (2001) *The Visual Display of Quantitative Information*.

Weeks 7-12 Material

- Everitt B S et al (2001) *Applied multivariate data analysis*.
- Johnson, D.E (1998) *Applied Multivariate Methods for Data Analysts*.
- Johnson, R.A. & Wichern, D.W. (2002) *Applied Multivariate Statistical Analysis*.
- Manly, B F J (2004) *Multivariate Statistical Methods - A Primer*.

Methods of communication

We will communicate with you via your university email and through announcements on iLearn. Queries to the unit convenors can sent to the unit convenor via the contact email on iLearn.

Unit Schedule

Week	Topic/s
1	Introduction & presenting data numerically
2	Good and bad graphical displays
3	Choosing different graphic displays
4	Displaying multivariate data
5	Similarities and distances
6	Hierarchical cluster analysis
7	K-means clustering
8	Principal component analysis
	TWO WEEK BREAK
9	Principal component analysis
10	Discriminant analysis
11	Multiple discriminant analysis
12	Classification and regression trees

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 2026.03 of the **Handbook**