STAT3102

Graphics, Multivariate Methods and Data Mining

Session 2, Special circumstances 2021

Archive (Pre-2022) - Department of Mathematics and Statistics

Contents

General Information	3
Learning Outcomes	3
General Assessment Information	4
Assessment Tasks	4
Delivery and Resources	6
Unit Schedule	6
Policies and Procedures	7

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Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.

General Information

Unit convenor and teaching staff
Unit Convenor/Lecturer
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Please refer to iLearn

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Credit points
10

Prerequisites
20cp at 2000 level including ((STAT270 or STAT2170) or (STAT271 or STAT2371) or (BIOL235(P) or BIOL2610) or (PSY222 or (PSY248(P) or PSYU2248))

Corequisites

Co-badged status

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.

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 ofmethods 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

WORK SUBMISSION: The submission link will be available on the iLearn site of the Unit.

LATE SUBMISSION OF WORK: All assessment tasks must be submitted by the official due date and time. In the case of late submission for a non-timed assessment (e.g. SGTA work), if special consideration has NOT been granted, 20% of the earned mark will be deducted for each 24-hour period (or part thereof) that the submission is late for the first 2 days (including weekends and/or public holidays). For example, if an assignment is submitted 25 hours late, its mark will attract a penalty equal to 40% of the earned mark. After 2 days (including weekends and public holidays) a mark of 0% will be awarded. Timed assessment tasks (e.g. tests) do not fall under these rules.

Assessment Tasks

Name	Weighting	Hurdle	Due
SGTA Works	10%	No	Weeks 3, 5, 7 and 10
Mid-Semester Test	30%	No	Week 8
Practical Test	60%	No	Week 12

SGTA Works

Assessment Type [1]: Qualitative analysis task
Indicative Time on Task [2]: 40 hours
Due: **Weeks 3, 5, 7 and 10**
Weighting: **10%**

The tasks given during four SGTA computer lab sessions are to be completed within the allocated time and submitted via iLearn. The four SGTA Works are worth 10% in total.

On successful completion you will be able to:

- Choose appropriate graphical techniques for displaying data.
- Choose the appropriate statistical analysis, for a given data set, from a wide range ofmethods 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.

Mid-Semester Test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 1 hours
Due: **Week 8**
Weighting: **30%**

Further information will be provided in the iLearn site of 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 ofmethods based on multivariate methods and data mining.

Practical Test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 2 hours
Due: **Week 12**
Weighting: **60%**

This is an open book style timed online exam. The practical test is designed to examine the use of software for data analysis and the software output interpretation skills taught in the unit. Further information will be provided in the iLearn site of 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 ofmethods 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
- the Writing Centre 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

Software: SPSS and R

The recommended references are

Chambers J M et al (1983) Graphical Methods for Data Analysis;

Cleveland W S (1994) Elements of Graphing Data;

Tufte E R (2001) The Visual Display of Quantitative Information;

Everitt B S et al (2001) Applied multivariate data analysis;

Johnson, R.A. & Wichern, D.W. (2002) Applied Multivariate Statistical Analysis;

Manly, B F J (2004) Multivariate Statistical Methods - A Primer.

Unit Schedule

Week	Topic	Due
	Introduction	
	Different graphical displays	

Week	Topic	Due
	Displaying multivariate data	SGTA Work
	Similarities and distances	
	Hierarchical cluster analysis	SGTA Work
	K-means clustering	
	Eigenvalues and eigenvectors	SGTA Work
	Principal component analysis	Mid-Semester Test
	Principal component analysis cont.	
	Discriminant analysis	SGTA Work
	Classification Trees Revision	
	Final assessment:	Practical Test

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (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
- Grade Appeal Policy
- Complaint Management 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). 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) 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 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 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

If you are a Global MBA student contact 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/.

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.