STAT6180

Applied Statistics

Session 1, In person-scheduled-weekday, North Ryde 2024

School of Mathematical and Physical Sciences

Contents

General Information

Unit convenor and teaching staff
Convenor
Iris Jiang
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Lecturer
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Credit points
10

Prerequisites
Admission to MAppStat or GradCertAppStat or GradDipAppStat or MSc or MDataSc or MLabQAMgt or GradDipLabQAMgt or GradCertLabQAMgt or MScInnovationStat

Corequisites
STAT6170 or STAT670

Co-badged status
STAT6180

Unit description
This unit aims to extend and broaden statistical experience from STAT6170, with a focus on application to real-world analysis. It covers relationships between categorical or continuous explanatory variables and a continuous response variable using the techniques of one-way and two-way analysis of variance and simple and multiple linear regression. Data management, report writing, graphical presentation of results, and power analysis are described.

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: Summarise data graphically and numerically and interpret them.

ULO2: Apply appropriate statistical methods, such as one-way ANOVA, two-way

ANOVA and multiple regression, to answer research questions.

ULO3: Understand and evaluate the assumptions underlying the models, and modify the analysis if needed.

ULO4: Use statistical software to create model output and interpret them.

General Assessment Information

Requirements to Pass this Unit

To pass this unit you must:

- Achieve a total mark equal to or greater than 50%.

Hurdle Assessments

There is no Hurdle Assessment.

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written 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. Submission time for all written assessments is set at 11:55 pm. A 1-hour grace period is provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for Special Consideration.

Assessments where Late Submissions will be accepted.

- iLearn Quiz – NO, unless Special Consideration is granted;
- Mid-Semester Test – NO, unless Special Consideration is granted;
- Assignment – YES, Standard Late Penalty applies;
- Final Exam – 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.

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 ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
iLearn Quiz	20%	No	Week 4
Mid-Semester Test	25%	No	Week 7
Assignment	25%	No	Week 11
Final Exam	30%	No	Formal Examination Period

iLearn Quiz

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 1 hours
Due: **Week 4**
Weighting: **20%**

The quiz will become available on iLearn.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Understand and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

Mid-Semester Test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 1 hours
Due: **Week 7**
Weighting: **25%**

Mid-semester Test

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Understand and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

Assignment

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 10 hours
Due: **Week 11**
Weighting: **25%**

The assignment will cover all learning outcomes.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Understand and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 2 hours
Due: **Formal Examination Period**
Weighting: **30%**

Formal invigilated examination testing the learning outcomes of the unit.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.

- Understand and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

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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

Classes

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

SGTA classes (beginning in Week 2): Students must register in and attend one two-hour class per week.

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

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

Suggested textbooks

The following textbook is useful as supplementary resources, for additional questions and explanations. They are available from the Macquarie University library:

- Moore, D.S., 2017. *Introduction to the Practice of Statistics*. WH Freeman and company.

Technology Used and Required

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/
- **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/

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 forum or sent to your

lecturers from your university email address.

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: https://www.mq.edu.au/about/coronavirus-faqs. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

This is a draft schedule and is subjected to change.

Week	Topics	Assignment
1	Course introduction; One-sided tests; Type I and Type II error; Introduction to R/RStudio	
2	Modified two-sample t-test; Assessing normality and equal variance assumptions	
3	One way ANOVA	
4	One way ANOVA, Multiple comparisons	iLearn Quizzes Due
5	Transformations; Non-parametrics; Power and Sample Size	
6	Data management; R Markdown; Simple linear regression	
7	Simple linear regression and model validation; Multiple regression	Mid-Semester Test Due
8	Multiple regression and model validation	
Session Break		
9	Extensions and examples of multiple regression	
10	Two-way ANOVA	
11	Two-Way ANOVA and Multiple Comparisons	Assignment Due
12	Two-Way ANOVA, Regression and Multiple Comparisons	
13	Exam Details and Revision	

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
- 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). 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

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/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- 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 AskMQ, or contact Service Connect.

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

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

Unit information based on version 2024.01R of the Handbook