STAT2170

Applied Statistics

Session 2, In person-scheduled-weekday, North Ryde 2022

School of Mathematical and Physical Sciences

Contents

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General Information

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Credit points
10

Prerequisites
FOSE1015 or STAT170(P) or STAT1170 or STAT171 or STAT1371 or STAT150 or STAT1250

Corequisites

Co-badged status
STAT6180

Unit description
This unit aims to extend and broaden statistical experience from 1000-level statistics units, 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 discussed.

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

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

ULO5: 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) classes in this unit is compulsory. Attendance and reasonable engagement in the class activities in at least 10 out of 12 of the SGTA classes are requirements to pass the unit. This is a hurdle requirement. See the unit iLearn page for more detail.

Attendance and Participation

Please contact the unit convenor as soon as possible if you have difficulty attending and participating in any classes. There may be alternatives available to make up the work. If there are circumstances that mean you will miss a class, you can apply for Special Consideration via a sk.mq.edu.au.

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following late penalty applied. Please see https://students.mq.edu.au/study/assessment-exams/assessments for more information.   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

In this unit, late submissions will be accepted as follows:

- SGTA Participation – NO, unless Special Consideration is granted
- iLearn Quizzes – 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

Final Exam Policy

It is Macquarie University's 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 for 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.e du.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 exam timetable page (https://iexams.mq.edu.au/timetable) for the dates of the final exam and the supplementary exam. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
SGTA Participation	0%	Yes	Weekly
iLearn Quiz	10%	No	Week 4
Mid-Semester Test	20%	No	Week 7
Assignment	20%	No	Week 11
Final Exam	50%	No	Formal Examination Period

SGTA Participation

Assessment Type [1]: Participatory task
Indicative Time on Task [2]: 6 hours
Due: **Weekly**
Weighting: **0%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Attendance and reasonable engagement in at least 80% SGTA classes is a requirement to pass the unit.

On successful completion you will be able to:

- Demonstrate foundational learning skills including active engagement in their learning process.

iLearn Quiz

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 1 hours
Due: **Week 4**
Weighting: **10%**

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.
- Justify 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: **20%**

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.

- Justify 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: **20%**

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.
- Justify and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.
- Demonstrate foundational learning skills including active engagement in their learning process.

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 2 hours
Due: **Formal Examination Period**
Weighting: **50%**

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.

- Justify 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

Off-shore students

Off-shore students must email the convenor as soon as possible to discuss study option.

Scheduled Activities

We have 2 hours of lectures and 2 hour of SGTA per week.

Textbook

There is no prescribed textbook.

Additional References

The following book is available in reserve at the library: Moore, D.S., McCabe, G. P. and Craig, B.A. (2017) Introduction to the Practice of Statistics, Ninth Edition

Software

You are required to use R/RStudio to perform data analyses. You will use R/RStudio as part of the SGTA classes. You can find more information on RStudio at their web site: https://www.rstudio.com/. The software is freely available to download at no cost for all standard operating systems (Windows, Mac OS and Linux) at https://www.rstudio.com/products/ rstudio/download/.

Numeracy Center

You are encouraged to leverage the drop-in service by Macquarie Numeracy Center, which aims to support students' study in Mathematics, Statistics, etc.

Unit Schedule

Week	Lectures	Work due
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 quiz
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 Exam
	Mid-Semester Break	
8	Multiple regression and model validation	
9	Extensions and examples of multiple regression	
10	Two-way ANOVA	
11	Two-way ANOVA continued and multiple comparisons	Assignment
12	Two-Way ANOVA and multiple regression connection	
13	Review	

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 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.