STAT6170

Introductory Statistics

Session 2, Online-scheduled-weekday 2023

School of Mathematical and Physical Sciences

Contents

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General Information

Unit convenor and teaching staff
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Credit points
10

Prerequisites

Corequisites

Co-badged status
STAT1170, FOSE1015, FOSX1015

Unit description
This unit provides a broad introduction to statistical concepts and data analysis techniques, providing basic statistical knowledge. The unit is concerned with the development of an understanding of statistical practice and is illustrated by a study of those techniques most commonly used in the sciences, social sciences and humanities. The aim of statistical practice is to make the scientific research process efficient; for this reason statistics is used in disciplines ranging from accountancy to zoology. Topics covered in this unit include: data collection methods; data quality; data summarisation; and statistical models like the normal distribution, followed by sampling distributions and statistical inferences about means, proportions and quantiles. Also studied are methods of analysis relating to comparisons, counted data and relationships, including regression and correlation. Statistical computer packages are used for handling and analysing data along with word processing for reporting the results. However, no prior computing knowledge is assumed.

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: Organise and summarise data graphically and numerically.

ULO2: Analyse and solve problems about distributions and sampling distributions.

ULO3: Evaluate and apply statistical strategies to answer a research question.

ULO4: Draw conclusions from the results of a statistical analysis.

ULO5: Evaluate the appropriateness of statistical methodologies when analysing a variety of problems arising from other fields of research.

ULO6: Demonstrate the ability to write a report based on a statistical analysis, using modern, specialised statistical software for analysis and presentation of results.

General Assessment Information

Requirements to Pass this Unit To pass this unit you must:

- Achieve a total mark equal to or greater than 50/60 in each Module Basic Test.

HURDLE ASSESSMENTS

- Assessment 1: Module Tests (75%) Low-stake quizzes serve as a formative assessment, providing a regular opportunity to demonstrate understanding and receive feedback for progress. This unit has FIVE module quiz tests, and you must show your mastery in acquiring statistical knowledge by completing and obtaining the required passing mark for each quiz by its due date. These are hurdle assessments meaning that failure to meet this requirement may result in a fail grade for the unit. Please contact **stat1170.admin@mq.edu**.au if you fail to meet the hurdle requirement.

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. *Statistical Report:*

- Statistical Report submission will be online through the iLearn page.
- For Statistical Report, late submissions will be accepted and standard Late Penalty applies.
- 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.

In this unit, no late submissions will be accepted for Module Tests - **unless permission is granted by contacting STAT1170.admind@mq.edu.au or an approval from a Special Consideration Application**

FINAL EXAM POLICY: There is no final exam for this unit.

Assessment Tasks

Name	Weighting	Hurdle	Due
Statistical report	25%	No	Week 13
Module tests	75%	Yes	Weeks 4, 6, 8, 10 and 12

Statistical report

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 10 hours
Due: **Week 13**
Weighting: **25%**

This assignment will test your ability to interpret research questions, analyse a data set and write a statistical report based on the results of the analyses.

On successful completion you will be able to:

- Organise and summarise data graphically and numerically.
- Analyse and solve problems about distributions and sampling distributions.
- Evaluate and apply statistical strategies to answer a research question.
- Draw conclusions from the results of a statistical analysis.
- Evaluate the appropriateness of statistical methodologies when analysing a variety of problems arising from other fields of research.
- Demonstrate the ability to write a report based on a statistical analysis, using modern, specialised statistical software for analysis and presentation of results.

Module tests

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Weeks 4, 6, 8, 10 and 12**
Weighting: **75%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

This unit consists of modules. At the end of each module there is a Module test, in which the student is required to demonstrate mastery of the material covered in that module.

On successful completion you will be able to:

- Organise and summarise data graphically and numerically.
- Analyse and solve problems about distributions and sampling distributions.
- Evaluate and apply statistical strategies to answer a research question.
- Draw conclusions from the results of a statistical analysis.
- Evaluate the appropriateness of statistical methodologies when analysing a variety of problems arising from other fields of research.

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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 must email stat1170.admin@mq.edu.au as soon as possible to discuss study options.

Census dates

Please check https://www.mq.edu.au/study/calendar-of-dates for the last day to withdraw from this unit without financial penalty, and the last date to withdraw from this unit without academic penalty.

Classes

STAT6170 will be delivered remotely, and no classes are scheduled.

Students will be given the opportunity to watch STAT1170-INT lecture recordings on Echo360.

Please note: there are no small group teaching activities (SGTA) or practical classes for STAT6170, but students are expected to work through the material used in STAT1170 classes.

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 board or sent to your lecturers [or stat1170.admin@mq.edu.au] 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.

Software

The technical software used in this unit is *Excel*, *R* and *RStudio*. Students will be given guidance on how to use these products, and be expected to complete the unit's assessments with the indicated software.

Help with STAT6170-Related Administrative Matters

For help with STAT6170-related administrative matters, students should email the convenor.

Required and Recommended Texts and/or Materials

- A calculator with statistics mode may be useful during lectures.
- Excel can be downloaded from the student portal. This can be accessed from the web page for Student IT services: http://students.mq.edu.au/it_services/. (Note that, as a Macquarie student, you have free access to Excel.)
- R and RStudio are freely available to everyone. Access and installation instructions may be found at https://www.r-project.org/ for R, and at https://rstudio.com/products/rstudio/download/ for RStudio.

Recommended textbook used in this unit:

- Modern Statistics: An introduction, Don McNeil and Jenny Middledorp (ISBN 9781486007011). This can be purchased in hard copy from, for example, the Coop Bookshop or in e-format (ISBN 9781486022120, access details to be provided in class).

Other recommended reading:

- Introduction to the Practice of Statistics, Moore, D.S. and McCabe, G. P (W.H. Freeman)
- Statistics without Tears by Rowntree (Penguin)
- Mind on Statistics by Utts & Heckard (Thomson, 2004)
- Elementary Statistics by Johnson & Kuby (Thomson, 2007)
- Statistics: The Art & Science of Learning from Data by Agresti & Franklin (Prentice Hall, 2007)
- The Statistical Sleuth by Ramsey and Schafer (Duxbury, 2002)

Technology Used and Required

iLearn, (which is a version of Moodle) is used for delivery of STAT6170 course material and can be accessed at: http://ilearn.mq.edu.au.

Unit Schedule

Unit Schedule

MODULE	WEEK	LECTURE TOPIC	ASSESSMENT
1	1 2	Introduction to statistics, Graphing data, Numerical summaries	**Online Quiz** [15 marks] • *Due in week 4* • *Topics: modules 1, Excel*
2	3 4	The Normal distribution, Distribution of means and proportions, Confidence intervals	**Online Quiz** [15 marks] • *Due in week 6* • *Topics: modules 1-2, Excel*
3	5 6	One sample hypothesis test for a population mean, Hypothesis tests for comparing population means	**Online Quiz** [15 marks] • *Due in week 8* • *Topics: modules 1-3, Excel*
4	7 8	Simple linear regression	**Online Quiz** [15 marks] • *Due in week 10* • *Topics: modules 1-4, Excel*
5	9 10	Hypothesis tests for a population proportion: z-test and chi-squared goodness-of fit, Chi-squared test of independence	**Online Quiz** [15 marks] • *Due in week 12* • *Topics: modules 1-5, Excel*

MODULE	WEEK	LECTURE TOPIC	ASSESSMENT
	11 12	Statistical report	**Statistical report** [25 marks] • *Due in week 13* • *Topics: modules 1-5, Excel, R*

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 an d maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://stu dents.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.