STAT2371

Statistics

Session 2, Special circumstance 2020

Department of Mathematics and Statistics

Contents

Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and ot her small group learning activities on campus for the second half-year, while keeping an online ver sion available for those students unable to return or those who choose to continue their studies onli ne.

To check the availability of face-to-face and onlin e activities for your unit, please go to timetable vi ewer. To check detailed information on unit asses sments visit your unit's iLearn space or consult yo ur unit convenor.

General Information

Unit convenor and teaching staff
Lead Convenor/Lecturer
Georgy Sofronov
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Second Convenor/Lecturer
Kenneth Beath
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Credit points
10

Prerequisites
STAT272 or STAT2372

Corequisites

Co-badged status

Unit description
This unit introduces the foundation concepts of statistics. The unit begins with a discussion of the aims of data analysis and the objectives of principal component analysis. A discussion of random samples and their use in drawing inferences about a population is then provided. The principles of statistical inference are developed with a particular focus on point estimators, confidence intervals and hypothesis testing.

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 using appropriate statistical analysis, descriptive statistics and

graphical presentation.

ULO2: Evaluate the appropriateness of a variety of statistical models/methods for various types of data, apply them, and interpret the results.

ULO3: Apply concepts related to statistical inference including point estimators, confidence intervals and hypothesis testing.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	10%	No	Week 5
Test	20%	No	Week 8
Assignment 2	10%	No	Week 11
Final Examination	60%	No	University examination period

Assignment 1

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 8 hours
Due: **Week 5**
Weighting: **10%**

Assignment

On successful completion you will be able to:

- Summarise data using appropriate statistical analysis, descriptive statistics and graphical presentation.
- Evaluate the appropriateness of a variety of statistical models/methods for various types of data, apply them, and interpret the results.
- Apply concepts related to statistical inference including point estimators, confidence intervals and hypothesis testing.

Test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 1 hours
Due: **Week 8**
Weighting: **20%**

Mid-Semester Test

On successful completion you will be able to:

- Summarise data using appropriate statistical analysis, descriptive statistics and graphical presentation.
- Evaluate the appropriateness of a variety of statistical models/methods for various types of data, apply them, and interpret the results.
- Apply concepts related to statistical inference including point estimators, confidence intervals and hypothesis testing.

Assignment 2

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 8 hours
Due: **Week 11**
Weighting: **10%**

Assignment

On successful completion you will be able to:

- Summarise data using appropriate statistical analysis, descriptive statistics and graphical presentation.
- Evaluate the appropriateness of a variety of statistical models/methods for various types of data, apply them, and interpret the results.
- Apply concepts related to statistical inference including point estimators, confidence intervals and hypothesis testing.

Final Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 3 hours
Due: **University examination period**
Weighting: **60%**

A 3-hour final exam held during the university formal examination period

On successful completion you will be able to:

- Summarise data using appropriate statistical analysis, descriptive statistics and graphical presentation.
- Evaluate the appropriateness of a variety of statistical models/methods for various types of data, apply them, and interpret the results.
- Apply concepts related to statistical inference including point estimators, confidence intervals and hypothesis testing.

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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

Delivery

The unit is delivered by lectures (3 hours per week, starting in Week 1) and SGTAs (1 hour per week, starting in Week 2). All teaching material will be available on iLearn.

SGTA Exercises will be available from iLearn prior to the SGTA. Students are expected to have attempted these prior to the SGTA. Solutions will be explained, with emphasis on any area students had trouble with. At the end of the week, these solutions will then be placed on iLearn.

The supported statistical software for this unit is R/RStudio. Students need to practice how to use the software and be expected to conduct their analyses using R/RStudio for the assignments. Students should also note that the test and the final examination may involve data analysis that contains inline R codes and output that students need to interpret to answer the questions.

Required and Recommended Texts and/or Materials

Recommended: Mendenhall W, Wackerly D and Scheaffer R. “Mathematical Statistics with Applications”, Seventh Edition QA276 .M426 2008. The Library also holds copies of the sixth and previous editions as well as the Student solutions manual. The following books are useful references for this unit:

Authors	Title	Library Call No.
Bain, L.J. & Engelhardt, M	Introduction to Probability and Mathematical Statistics	QA273.B2546/1992

Authors	Title	Library Call No.
Conover, W.J.	Practical Nonparametric Statistics	QA278.8.C65/1999
Hogg, R.V. & Craig, A.T.	Introduction to Mathematical Statistics	QA276.H59 / 1995
Larson, H.J.	Introduction to Probability Theory and Statistical Inference	QA273.L352/1982
Walpole, R.E. & Myers, R.H.	Probability and Statistics for Engineers and Scientists	TA340.W35/1993

Unit Schedule

TOPIC	MATERIAL COVERED
1	Introduction. Statistical terms and notations.
2	Random sampling and sampling distributions.
3	Estimation and estimators. Point estimation methods, including the method of moments and maximum likelihood. Properties of estimators. Asymptotic (large sample) properties.
4	Confidence intervals.
5	Hypothesis testing and goodness of fit.
6	One-way analysis of variance (ANOVA) and multiple comparisons.
7	Transformations, non-parametric tests, power and data management.
8	Two-way ANOVA and multiple regression.
9	Data analysis including exploratory data analysis.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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 *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/study/getting-started/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.