STAT8609

Linear Models

Session 1, Fully online/virtual 2020

Department of Mathematics and Statistics

Contents

General Information

Unit convenor and teaching staff
Credit points 10
Prerequisites ((Admission to MBioStat or GradDipBioStat or GradCertBioStat) and (BCA801 or STAT8601) and (BCA817 or STAT8603)) or (admission to MActPrac and (STAT810 or STAT806 or STAT8310))
Corequisites ((Admission to MBioStat or GradDipBioStat or GradCertBioStat) and (BCA805 or STAT8604)) or admission to MActPrac
Co-badged status
Unit description The aim of this unit is to enable students to apply methods based on linear models to biostatistical data analysis, with proper attention to underlying assumptions and a major emphasis on the practical interpretation and communication of results. The following topics are covered: the method of least squares; regression models and related statistical inference; flexible nonparametric regression; analysis of covariance to adjust for confounding; multiple regression with matrix algebra; model construction and interpretation (use of dummy variables, parametrisation, interaction and transformations); model checking and diagnostics; regression to the mean; handling of baseline values; the analysis of variance; variance components and random effects Because of the multi-institutional nature of the BCA units, there is an early cut-off for enrolment in this unit, which is typically one week before the start of the session. Please contact the program coordinator for details.

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: Have a sound understanding of the normal linear model including a theoretical grounding in the principles of least squares and likelihood-based estimation and related statistical inference, to the level of being able to manipulate equations required for

deriving formulas for estimates and their standard errors for the standard models.

ULO2: Understand the principles and practice of model checking and diagnostics, and the use of transformations, in particular the log transformation, to improve model fit; understand the appropriate use of analysis of covariance to adjust for confounding; have a good working knowledge of the theory and practice of multiple regression analysis; be familiar with the method of analysis of variance (up to 2 factor models) and its relationship to multiple regression; gain an introductory understanding of nonparametric smoothing for flexible regression modelling, and of the use of variance components and random effects models.

ULO3: Have a strong grasp of practical issues involved in fitting linear models, including the ability to construct defensible models (use of dummy variables, choice of parameterisation, interaction and transformation of variables); demonstrate ability to fit models using modern statistical software and to interpret fitted models in terms that are useful to non-statisticians.

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult iLearn for revised unit information.

Find out more about the Coronavirus (COVID-19) and potential impacts on staff and students

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

TBC

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.