ACST8040

Quantitative Research Methods

Session 1, Special circumstances 2021

Department of Actuarial Studies and Business Analytics

Contents

Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to timetable viewer. To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff Unit Convenor Xian Zhou xian.zhou@mq.edu.au
Credit points 10
Prerequisites Admission to MActPrac and (STAT810 or STAT8310 or STAT806)
Corequisites
Co-badged status
Unit description This unit focuses on statistical approaches for research in Business and Economics and related disciplines. Topics include a range of probability and statistical models, their theoretical basis, the assessment and evaluation of the models, and methods of statistical inference for data analysis. The unit will also consider applications of the above models and techniques to the actuarial practice discipline.

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: Understand the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.

ULO2: Critique, replicate and extend basic actuarial research using statistical models.

ULO3: Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.

ULO4: Explain how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

ULO5: Use statistical software R to solve actuarial problems.

General Assessment Information

Assessment criteria for all assessment tasks will be provided on the unit iLearn site.

It is the responsibility of students to view their marks for each within-session-assessment on iLearn within 20 days of posting. If there are any discrepancies, students must contact the unit convenor immediately. Failure to do so will mean that queries received after the release of final results regarding assessment tasks (not including the final exam mark) will not be addressed.

Late submissions and extensions

Tasks 10% or less – No extensions will be granted. Students who have not submitted the task prior to the deadline will be awarded a mark of 0 for the task, except for cases in which an application for special consideration is made and approved.

Tasks above 10% - No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 20% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. No submission will be accepted after solutions have been posted.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	20%	No	27/03/21
Assignment 2	40%	No	15/05/21
Assignment 3	40%	No	04/06/21

Assignment 1

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 15 hours
Due: **27/03/21**
Weighting: **20%**

Assignment 1 consists of objective response questions requiring explanations in appropriate words and/or mathematical expressions.

On successful completion you will be able to:

- Understand the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.
- Critique, replicate and extend basic actuarial research using statistical models.
- Ask questions and communicate problems relating to statistical models, and to explain

and discuss ideas relating to implementation of statistical models.

Assignment 2

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 30 hours
Due: **15/05/21**
Weighting: **40%**

Assignment 2 consists of problem-solving questions requiring detailed solutions

On successful completion you will be able to:

- Understand the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.
- Critique, replicate and extend basic actuarial research using statistical models.
- Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.
- Explain how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

Assignment 3

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 30 hours
Due: **04/06/21**
Weighting: **40%**

Assignment 3 consists of problem-solving questions requiring detailed solutions including numerical solutions using statistical software R.

On successful completion you will be able to:

- Understand the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.
- Critique, replicate and extend basic actuarial research using statistical models.
- Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.
- Explain how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.
- Use statistical software R to solve actuarial problems.

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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

- This unit is taught through 3 hours of combined lectures/tutorials per week.
- The timetable for classes can be found on the University web site at: http://www.timetables.mq.edu.au/

Unit Web Page

- The web page for this unit can be found at: http://ilearn.mq.edu.au

Technology Used and required

- You will need access to the internet to obtain course information and download teaching materials from the unit website.
- It is your responsibility to check the unit website regularly to make sure that you are up-to-date with the information for the unit.
- The statistical package R will be used to calculate numerical results from time to time.

Required and Recommended Texts and/or Materials

- Lecture Notes are the required materials and will be posted on the website before the lectures.
- Relevant references will be provided in Lecture Notes as recommended materials. Some of them will be posted on the website.

Unit Schedule

Week 1: Nonparametric statistical methods; background knowledge

Week 2: One-sample location problem

Week 3: Estimation of location parameters; Two-sample location problem

Week 4: Two-sample dispersion and other problems

Week 5: One-way layout; **Assignment 1**

Week 6: One-way layout

Week 7: Two-way layout

Week 8: Two-way layout

Week 9: Independence problem

Week 10: Independence problem; **Assignment 2**

Week 11: Regression problem

Week 12: Bootstrap estimation

Week 13: Revision; **Assignment 3**

Note: This is only a tentative schedule. The actual schedule will be adjusted from time to time in accordance with the progress of lectures.

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
- Grade Appeal Policy
- Complaint Management 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

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.

Unit information based on version 2021.03 of the Handbook