



ACST8083

Actuarial Statistics

Session 1, Special circumstances 2021

Department of Actuarial Studies and Business Analytics

Contents

| | |
|--|---|
| General Information | 2 |
| Learning Outcomes | 2 |
| General Assessment Information | 3 |
| Assessment Tasks | 3 |
| Delivery and Resources | 5 |
| Policies and Procedures | 5 |

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

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

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| Unit convenor and teaching staff Unit Convenor Hanlin Shang hanlin.shang@mq.edu.au |
| Credit points 10 |
| Prerequisites STAT810 or STAT8310 or STAT806 |
| Corequisites |
| Co-badged status |
| Unit description This unit examines the use of statistical models in the general insurance context. Applications will include linear models and generalised linear models and Bayesian statistics including Credibility Theory. Students gaining a credit average across both ACST8083 and STAT8310 (minimum mark of 60 on both units) will satisfy the requirements for exemption from the professional subject CS1 of the Actuaries Institute. |

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: Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory.

ULO2: Explain and apply both simple and multiple linear regression methodology.

ULO3: Develop an understanding of the theory and practice of generalised linear modelling (GLMs).

ULO4: Explain and apply the fundamental concepts of Bayesian statistics.

ULO5: Apply credibility theory to insurance problems.

ULO6: Apply these statistical techniques in solving practical insurance 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 |
|-------------------------------------|-----------|--------|-------------------------------|
| <u>Class Test</u> | 20% | No | Week 7 |
| <u>Assignment 1</u> | 10% | No | Week 9 |
| <u>Assignment 2</u> | 10% | No | Week 12 |
| <u>Final Exam</u> | 60% | No | During University Exam Period |

Class Test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **Week 7**

Weighting: **20%**

The test will be approximately 90 minutes, to be held during class time.

On successful completion you will be able to:

- Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory.
- Explain and apply both simple and multiple linear regression methodology.
- Develop an understanding of the theory and practice of generalised linear modelling

(GLMs).

- Apply these statistical techniques in solving practical insurance problems.

Assignment 1

Assessment Type ¹: Quantitative analysis task

Indicative Time on Task ²: 10 hours

Due: **Week 9**

Weighting: **10%**

This is an individual assignment which focuses on problem solving using R.

On successful completion you will be able to:

- Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory.
- Explain and apply both simple and multiple linear regression methodology.
- Develop an understanding of the theory and practice of generalised linear modelling (GLMs).
- Apply these statistical techniques in solving practical insurance problems.

Assignment 2

Assessment Type ¹: Quantitative analysis task

Indicative Time on Task ²: 10 hours

Due: **Week 12**

Weighting: **10%**

This is an individual assignment which focuses on problem solving using R.

On successful completion you will be able to:

- Explain and apply the fundamental concepts of Bayesian statistics.
- Apply credibility theory to insurance problems.
- Apply these statistical techniques in solving practical insurance problems.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 28 hours

Due: **During University Exam Period**

Weighting: **60%**

The final examination will be closed book, a three-hour written paper with ten minutes reading time, to be held during the University Examination period.

On successful completion you will be able to:

- Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory.
- Explain and apply both simple and multiple linear regression methodology.
- Develop an understanding of the theory and practice of generalised linear modelling (GLMs).
- Explain and apply the fundamental concepts of Bayesian statistics.
- Apply credibility theory to insurance problems.
- Apply these statistical techniques in solving practical insurance problems.

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

Please refer to the university timetable at <https://timetables.mq.edu.au/2021/> for class times.

All other information will be available on iLearn.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](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 \(https://students.mq.edu.au/support/study/policies\)](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 \(https://policies.mq.edu.au\)](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.