



ACST883

Actuarial Statistics

S1 Day 2019

Department of Actuarial Studies and Business Analytics

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	5
<u>Policies and Procedures</u>	5
<u>Graduate Capabilities</u>	6
<u>Supplementary exams</u>	9

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General Information

Unit convenor and teaching staff

Unit convenor

David Pitt

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Contact via Contact via email

4 Eastern Road, Room 608

Mondays 4-5 during David's teaching weeks

Lecturer

Ken Siu

ken.siu@mq.edu.au

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4 Eastern Road, Room 618

To be advised

Credit points

4

Prerequisites

STAT810 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, generalised linear models and Bayesian statistics including credibility theory.

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:

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

Explain, understand and apply both simple and multiple linear regression methodology

Develop a deep 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

General Assessment Information

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

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

Where a Special consideration application is approved, the student may be offered an alternative assessment or may receive a mark based on the percentage mark achieved by the student in one or more other assessment tasks, at the Unit Convenor's discretion.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Assignments 1 and 2</u>	20%	No	Week 9 and Week 12
<u>Class Test</u>	10%	No	Week 7
<u>Final exam</u>	70%	No	Exam period

Assignments 1 and 2

Due: **Week 9 and Week 12**

Weighting: **20%**

There are two assignments due in Week 9 (10%) and Week 12 (10%). Marks will be granted for accuracy and clarity of the work submitted. The assignments will be submitted electronically through iLearn. Details will be provided when the assignment tasks are released. A marking rubric will be released when the assignment tasks are released outlining the criteria and standards required.

No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded 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.

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, understand and apply both simple and multiple linear regression methodology
- Develop a deep 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

Class Test

Due: **Week 7**

Weighting: **10%**

The class test covers the lecture content in Weeks 1 to 5 (and associated tutorial material). Students will have 75 minutes to complete the test. Marks will be granted for accuracy and clarity of the work submitted. It will be conducted in the Monday lecture in Week 7.

You will be given the ACST883 Formulae Sheet to use during the class test. No other materials may be referred to during the test. Non-programmable calculators with no text-retrieval capacity are permitted.

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, understand and apply both simple and multiple linear regression methodology

Final exam

Due: **Exam period**

Weighting: **70%**

A three hour written exam will be held during the normal university exam period. Questions will cover the entire unit including all work (both computing work and all other work) covered in lectures and tutorials. Marks will be granted for accuracy and clarity of the work shown.

You will be given the ACST883 Formulae Sheet to using during the final examination. No other materials may be referred to during the exam. Non-programmable calculators with no text-retrieval capacity are permitted.

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, understand and apply both simple and multiple linear regression methodology
- Develop a deep 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

Delivery and Resources

The timetable for classes can be found on the University website at:

<https://timetables.mq.edu.au/2019/>

Lecture notes are available for download from iLearn. You will need to print the lecture notes and bring them to classes to complete.

There is no required textbook.

Students will be required to use iLearn, R, PDF, Word and a non-programmable calculator.

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) (<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.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway](http://students.mq.edu.au/support/study/student-policy-gateway) (<http://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) (<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 improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

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.

Graduate Capabilities

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Explain, understand and apply both simple and multiple linear regression methodology
- Develop a deep 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

Assessment tasks

- Assignments 1 and 2
- Final exam

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory
- Explain, understand and apply both simple and multiple linear regression methodology
- Develop a deep 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

Assessment tasks

- Assignments 1 and 2
- Class Test
- Final exam

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory
- Explain, understand and apply both simple and multiple linear regression methodology
- Develop a deep 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

Assessment tasks

- Assignments 1 and 2
- Class Test
- Final exam

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Apply the method of maximum likelihood estimation in a range of contexts and understand associated statistical distribution theory
- Explain, understand and apply both simple and multiple linear regression methodology
- Develop a deep 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

Assessment tasks

- Assignments 1 and 2
- Class Test
- Final exam

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different

social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Explain, understand and apply both simple and multiple linear regression methodology
- Explain and apply the fundamental concepts of Bayesian statistics

Assessment tasks

- Assignments 1 and 2
- Class Test
- Final exam

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- Develop a deep understanding of the theory and practice of generalised linear modelling (GLMs)
- Apply credibility theory to insurance problems

Assessment task

- Assignments 1 and 2

Supplementary exams

Supplementary exams

Information regarding supplementary exams, including dates, is available at:

http://www.businessandconomics.mq.edu.au/current_students/undergraduate/how_do_i/disruption_to_studies