



ACST8085

Quantitative Methods for Risk Analysis

Session 2, Special circumstance 2020

Department of Actuarial Studies and Business Analytics

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Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online 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

Convenor

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Lecturer

Jackie Li

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Credit points

10

Prerequisites

STAT810 or STAT8310 or STAT806

Corequisites

Co-badged status

Unit description

This unit explores the use of statistical models in insurance: loss distributions with and without risk sharing, compound distributions and their applications in risk modelling, introduction to copulas, extreme value theory. The concepts underlying time series models and actuarial applications of time series models are also studied. Students gaining a weighted average of credit across all of ACST8084, ACST8085 and the CS2-related components of the assessment in ACST8086 (minimum mark of 60% on all three components) will satisfy the requirements for exemption from the professional subject CS2 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: Model insurance claims using loss distributions.

ULO2: Construct risk models with frequency and severity distributions.

ULO3: Use premium principles to price insurance products.

ULO4: Model dependence and extreme events by copulas and extreme value theory.

ULO5: Apply time series models to financial and economic variables.

ULO6: Apply the various statistical techniques and quantitative methods in solving practical insurance problems.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	5%	No	Week 3
Class Test	20%	No	Week 7
Assignment 2	15%	No	Week 12
Final Exam	60%	No	Week 14

Assignment 1

Assessment Type ¹: Quantitative analysis task

Indicative Time on Task ²: 5 hours

Due: **Week 3**

Weighting: **5%**

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

On successful completion you will be able to:

- Model insurance claims using loss distributions.

Class Test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 10 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:

- Model insurance claims using loss distributions.
- Construct risk models with frequency and severity distributions.

Assignment 2

Assessment Type ¹: Quantitative analysis task

Indicative Time on Task ²: 15 hours

Due: **Week 12**

Weighting: **15%**

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

On successful completion you will be able to:

- Model insurance claims using loss distributions.
- Construct risk models with frequency and severity distributions.
- Use premium principles to price insurance products.
- Model dependence and extreme events by copulas and extreme value theory.
- Apply the various statistical techniques and quantitative methods in solving practical insurance problems.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 28 hours

Due: **Week 14**

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:

- Model insurance claims using loss distributions.
- Construct risk models with frequency and severity distributions.
- Use premium principles to price insurance products.
- Model dependence and extreme events by copulas and extreme value theory.
- Apply time series models to financial and economic variables.

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

The course will be delivered online. The course materials will be made available to all enrolled

students.

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.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/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) (<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.