



ACST8086

Actuarial Modelling

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

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Credit points

10

Prerequisites

STAT810 or STAT8310 or STAT806

Corequisites

Co-badged status

Unit description

Survival models will be used to estimate decrement rates from actual experience, compare these with standard rates, and prepare new tables. In constructing new tables, consideration will be given to risk factors; selection; data collection; graduation; and testing the graduation. The concept of actuarial modelling will be discussed. Methods for mortality projection will be described and applied. Machine learning will be introduced. The 'actuarial control cycle', a conceptual framework of the processes for developing and managing financial enterprises and products, will be 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: Examine and employ a variety of exposed to risk, graduation and mortality projection techniques.

ULO2: Develop an understanding of aspects of the theory and practice of statistical

learning methods.

ULO3: Model and critically analyse scenarios involving financial risks for various types of financial institutions and compare ways of managing these risks.

ULO4: Discuss the concept of the Actuarial Control Cycle and apply it to solve a variety of practical business problems involving financial and actuarial risks.

ULO5: Identify and apply the relevant statistical techniques in solving practical actuarial problems within the actuarial control cycle framework.

General Assessment Information

Gradebook

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 the 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

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

Late submissions and extensions

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.

Special consideration

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>Final Exam</u> | 30% | No | University Exam Period |
| <u>Group Presentation</u> | 10% | No | Week 9 - 13 |
| <u>Class Test</u> | 30% | No | Week 10 |
| <u>Assignment</u> | 30% | No | Week 9 |

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 15 hours

Due: **University Exam Period**

Weighting: **30%**

The final examination will be closed book, a one and half hours written paper with ten minutes reading time, to be held during the University Examination period.

On successful completion you will be able to:

- Model and critically analyse scenarios involving financial risks for various types of financial institutions and compare ways of managing these risks.
- Discuss the concept of the Actuarial Control Cycle and apply it to solve a variety of practical business problems involving financial and actuarial risks.
- Identify and apply the relevant statistical techniques in solving practical actuarial problems within the actuarial control cycle framework.

Group Presentation

Assessment Type ¹: Presentation

Indicative Time on Task ²: 5 hours

Due: **Week 9 - 13**

Weighting: **10%**

The presentation is an oral presentation to the class.

On successful completion you will be able to:

- Model and critically analyse scenarios involving financial risks for various types of financial institutions and compare ways of managing these risks.
- Discuss the concept of the Actuarial Control Cycle and apply it to solve a variety of practical business problems involving financial and actuarial risks.
- Identify and apply the relevant statistical techniques in solving practical actuarial problems within the actuarial control cycle framework.

Class Test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 15 hours

Due: **Week 10**

Weighting: **30%**

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

On successful completion you will be able to:

- Examine and employ a variety of exposed to risk, graduation and mortality projection techniques.
- Develop an understanding of aspects of the theory and practice of statistical learning methods.

Assignment

Assessment Type ¹: Project

Indicative Time on Task ²: 30 hours

Due: **Week 9**

Weighting: **30%**

This is an individual assignment which focuses on actuarial modelling using R.

On successful completion you will be able to:

- Examine and employ a variety of exposed to risk, graduation and mortality projection techniques.
- Develop an understanding of aspects of the theory and practice of statistical learning methods.

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

There is no textbook for this unit. Unit materials are available on iLearn. Lectures will be pre-recorded and made available online while tutorials will be delivered face-to-face on campus and recorded.

Students will make extensive use of the R language for statistical computing. Students will also be required to submit code scripts for checking.

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.