ACST8086

Actuarial Modelling

Session 2, In person-scheduled-weekday, North Ryde 2024

Department of Actuarial Studies and Business Analytics

Contents

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General Information

Unit convenor and teaching staff
Unit Convenor / Lecturer
Alan Xian
alan.xian@mq.edu.au
Contact via By email

Lecturer
Bruce Edwards

Credit points
10

Prerequisites
STAT806 or STAT810 or STAT8310

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.

ULO6: Explain and justify decision making to different stakeholders using the actuarial control cycle framework

General Assessment Information

Late Assessment Submission Penalty (written assessments)

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55pm. A 1-hour grace period is provided to students who experience a technical concern.

For any late submissions of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for Special Consideration.

Assessment Tasks

Name	Weighting	Hurdle	Due
Class Test	25%	No	Week 5
Assignment	25%	No	Week 12
Group Presentation	25%	No	Week 13
Final Exam	25%	No	Exam Period

Class Test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 15 hours
Due: **Week 5**
Weighting: **25%**

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]: 25 hours
Due: **Week 12**
Weighting: **25%**

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.

Group Presentation

Assessment Type [1]: Presentation
Indicative Time on Task [2]: 10 hours
Due: **Week 13**
Weighting: **25%**

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.

- Explain and justify decision making to different stakeholders using the actuarial control cycle framework

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 15 hours
Due: **Exam Period**
Weighting: **25%**

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.

- Explain and justify decision making to different stakeholders using the actuarial control cycle framework

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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

This course will involve weekly seminars (run face-to-face) with recordings available online. There will also be weekly tutorials (also run face-to-face only) which will not be recorded.

Additionally, online consultations will be run during the course based on demand and proximity to assessment deadlines.

All material for the course including lecture slides, recordings and tutorial exercises will be provided via iLearn. There is no prescribed textbook for this course.

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
- Assessment Procedure
- Complaints Resolution 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

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the 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

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

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 2024.03 of the Handbook