



ACST4005

Actuarial Data Analytics

Session 2, In person-scheduled-weekday, North Ryde 2026

Department of Actuarial Studies and Business Analytics

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General Information

Unit convenor and teaching staff

Unit Convenor

Maggie Lee

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Lecturer

Pavel Shevchenko

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Credit points

10

Prerequisites

ACST3058 and ACST3059 and (ACST3057 or ACST3060 or ACST3061)

Corequisites

Co-badged status

Unit description

This unit covers tools and techniques in data analytics. Students will be taught how to apply these skills in a range of business environments and will be able to contribute to all stages of developing solutions to analytical problems across multiple industries or domains. This unit has a focus on practical application using a variety of real-life case studies. Students gaining a grade of credit or higher in this unit are eligible for exemption from the Data Analytics Principles subject 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: Explain the key iterative steps involved in building a model (business understanding, data understanding and preparation, modelling, evaluation, communication and deployment).

ULO2: Describe the various stages in data understanding and preparation and apply these skills within the context of practical problems.

ULO3: Compare predictive modelling techniques to select an appropriate method for a stated situation and perform predictive modelling for a given set of data.

ULO4: Use a range of perspectives (statistical techniques and measures, business context and objectives etc.) to evaluate the appropriateness of a model.

ULO5: Communicate modelling results to a range of business decision making audiences, taking into account the audience's needs and relating findings back to the original business objectives.

General Assessment Information

Late Submission Penalties

If you submit your assessment late, 5% of the total possible marks will be deducted for each day (including weekends), up to 7 days. Submissions more than 7 days late will receive a mark of 0.

Example 1 (out of 100):

If you score 85/100 but submit **20 hours late**, you will lose **5 marks** and receive **80/100**.

Example 2 (out of 30):

If you score 27/30 but submit **20 hours late**, you will lose **1.5 marks** and receive **25.5/30**.

Extensions

Automatic short extension: Some assessments are eligible for automatic short extension. You can only apply for an automatic short extension before the due date.

Special Consideration: If you need more time due to serious issues and for any assessments that are not eligible for Short Extension, you must apply for Special Consideration. Need help? Review the [Special Consideration page](#) for further details.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Skills development: Reflection portfolio	20%	No	21/09/2026	Individual	Yes	Open
Professional practice: Data analytics report	20%	No	26/10/2026	Individual	Yes	Open
Formal examination	60%	No	University Examination Period	Individual	No	Observed

Skills development: Reflection portfolio

Assessment Type ¹: Portfolio

Indicative Time on Task ²: 25 hours

Due: **21/09/2026**

Weighting: **20%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The purpose of this assessment is for you to demonstrate your skills in practical actuarial data analytics scenarios.

You will apply actuarial analytics concepts to complete a portfolio of project-based tasks.

Skills in focus:

- Discipline knowledge
- Digital skills
- Communication skills
- Critical thinking and problem solving
- Work readiness

Deliverable(s): Written submission [max 1000 words] and a supplementary presentation and a R code file.

Individual assessment

On successful completion you will be able to:

- Explain the key iterative steps involved in building a model (business understanding, data understanding and preparation, modelling, evaluation, communication and deployment).
- Describe the various stages in data understanding and preparation and apply these skills within the context of practical problems.
- Compare predictive modelling techniques to select an appropriate method for a stated situation and perform predictive modelling for a given set of data.
- Use a range of perspectives (statistical techniques and measures, business context and objectives etc.) to evaluate the appropriateness of a model.
- Communicate modelling results to a range of business decision making audiences, taking into account the audience's needs and relating findings back to the original business objectives.

Professional practice: Data analytics report

Assessment Type ¹: Professional task

Indicative Time on Task ²: 20 hours

Due: **26/10/2026**

Weighting: **20%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The purpose of this assessment is for you to demonstrate your actuarial data analytics skills in commercial scenarios.

You will apply modern modelling tools and techniques learnt throughout the semester to commercial scenarios provided in a case study.

Skills in focus:

- Discipline knowledge
- Digital skills
- Communication skills
- Critical thinking and problem solving
- Work readiness

Deliverable(s): Written report [max 2000 words]

Individual Assessment

On successful completion you will be able to:

- Explain the key iterative steps involved in building a model (business understanding, data understanding and preparation, modelling, evaluation, communication and deployment).
- Describe the various stages in data understanding and preparation and apply these skills within the context of practical problems.
- Compare predictive modelling techniques to select an appropriate method for a stated situation and perform predictive modelling for a given set of data.
- Use a range of perspectives (statistical techniques and measures, business context and objectives etc.) to evaluate the appropriateness of a model.
- Communicate modelling results to a range of business decision making audiences, taking into account the audience's needs and relating findings back to the original business objectives.

Formal examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 28 hours

Due: **University Examination Period**

Weighting: **60%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

The purpose of this assessment is for you to formally demonstrate the expertise you have gained in this unit.

You will participate in a 3-hour exam held during the University Examination period. Important information about the exam will be made available on the unit iLearn page. You should also review the [MQ Exams website](#) for general tips.

Deliverable(s): Formal exam

Individual assessment

On successful completion you will be able to:

- Explain the key iterative steps involved in building a model (business understanding, data understanding and preparation, modelling, evaluation, communication and deployment).
- Describe the various stages in data understanding and preparation and apply these skills within the context of practical problems.
- Compare predictive modelling techniques to select an appropriate method for a stated situation and perform predictive modelling for a given set of data.
- Use a range of perspectives (statistical techniques and measures, business context and objectives etc.) to evaluate the appropriateness of a model.
- Communicate modelling results to a range of business decision making audiences, taking into account the audience's needs and relating findings back to the original business objectives.

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
- [Academic Success](#) 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.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

Classes

ACST4005 is offered via classes on North Ryde campus (Macquarie University). Students share lecture classes and a common teaching website with the units ACST8095 and ACST7095.

Online lecture recordings

In all weeks, standard recordings of campus lectures using the University's lecture recording facility (ECHO360 or zoom) will be available. The recordings capture audio and screenshot. The recordings will either be provided via the ECHO360 link which is located on the right hand side of the webpage or via a zoom link.

Timetable

The timetable for classes can be accessed through eStudent Class Finder.

Alterations to the class times or locations will be advised in class and on the teaching website.

Teaching staff

Maggie Lee is the unit convenor and will be taking four weeks of classes. Maggie can be contacted via Dialogue on the website, or during her consultation hours.

Professor Pavel Shevchenko will be taking the other weeks of classes. Pavel can be contacted via Dialogue on the website, or during his consultation hours.

We also have a teaching administrator who can deal with any administrative queries related to the unit. They can be contacted via Dialogue on the website (more details to follow).

Assumed knowledge

We assume from the start of the Actuarial Data Analytics that you have acquired the knowledge and skills in subjects from the Foundation Program (Part 1s) of the Actuaries Institute education program.

Lecture slides/Learning Guide

There will be Lecture Slides and/or Learning Guides and associated readings for each section of work. You should read these materials in advance of the lectures, and bring a copy with you to classes.

Technology Used and Required

In this unit, you will need to have access to and to be able to use software to code (R and R studio) and word-processing software to produce reports.

Teaching Website

Course material is available on the online learning management system (iLearn). The teaching

website is integral to this unit. Passive involvement in this unit greatly reduces the likelihood of achieving the exemption standard of understanding. Interaction with other students and with teachers is very important, and the website is the forum for that interaction. You will need to be accessing the website regularly to see announcements, read postings and stay informed - at least every couple of days. This is your responsibility and we cannot make any allowances for students who miss important information due to not checking the website regularly. The website entry page is at: <http://ilearn.mq.edu.au>

Teaching and Learning Activities

The unit is taught as set out in the Classes section. The Unit Schedule sets out the assessment and the topics covered in each week of the session.

Exemptions

The Macquarie University unit ACST4005/ACST7095/ACST8095 will satisfy the requirements for exemption from the Data Analytics Principles subject of the Actuary program of the Actuaries Institute. You will be recommended for exemption if you attain grades of Credit or better in this unit. It is the responsibility of the student to apply to Macquarie University to recommend them to the Actuaries Institute for professional exemptions. More information will be made available via iLearn.

Unit Schedule

Week	Week beginning	Topic	Lecturer	Assessment task
1	27-Jul	Business Environment	ML	
2	3-Aug	Communication	ML	
3	10-Aug	Data exploration	ML	
4	17-Aug	Data quality	ML	
5	24-Aug	Data manipulation and cleansing	PS	
6	31-Aug	Basic Concepts and Linear Regression	PS	
7	7-Sep	Linear Regression II	PS	
8	14-Sep	Model Selection	PS	
Break	21-Sep			Project Presentation
Break	28-Sep			
9	5-Oct	GLM (Poisson Regression), clustering	PS	

10	12-Oct	Regression Tree methods	PS	
11	19-Oct	Classification	PS	
12	26-Oct	Neural Networks and Generalised Additive Models	PS	Case Studies
13	2-Nov	Mortality modelling	PS	

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](#)
- [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) (<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 connect.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/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [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 the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

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 2026.04 of the [Handbook](#)