BUSA8001

Applied Predictive Analytics

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

Department of Actuarial Studies and Business Analytics

Contents

General Information

Unit convenor and teaching staff Masoud Talebian masoud.talebian@mq.edu.au
Credit points 10
Prerequisites (BUSA6004 and BUSA8000) or (Admission to MActPrac or GradCertResMQBS or GradDipResMQBS)
Corequisites
Co-badged status
Unit description This advanced-level unit builds on prior training in data analytics and quantitative methods. Students will prepare and analyse structured datasets using Python and its associated open-source libraries, apply data visualisation techniques for exploratory analysis, and develop predictive models for various business applications including credit risk, housing prices, and asset valuation. The unit further introduces unsupervised learning methods such as clustering, and text analytics techniques for sentiment and topic modelling.

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: Critically evaluate data requirements to generate predictive models that support decision-making.

ULO2: Critically evaluate and apply advanced predictive analytics techniques to solve complex business problems.

ULO3: Devise and implement optimised computer algorithms to develop predictive analytics with efficiency and accuracy.

ULO4: Demonstrate an advanced understanding of contemporary analytical techniques and their application in solving problems.

ULO5: Collaborate effectively in diverse teams to develop predictive models for real-world business applications.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Professional practice: Modelling analysis 2	30%	No	Week 13	Group	No	Open AI
Formal examination	40%	No	Exam Period	Individual	No	Observed
Professional practice: Modelling analysis 1	30%	No	04/09/2026	Individual	Yes	Open AI

Professional practice: Modelling analysis 2

Assessment Type [1]: Problem-based task
Indicative Time on Task [2]: 25 hours
Due: **Week 13**
Weighting: **30%**
Groupwork/Individual: Group
Short extension [3]: No
AI Approach: Open AI

The purpose of this assessment is for you work with your peers to develop and apply your skills in addressing complex analytics tasks using Python, aligned with industry standards.

You will solve a business problem through data-driven analysis developing predictive or analytical models, implementing solutions using Python and presentation recommendations and rationale.

Skills in focus:

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

Deliverable(s): Modelling task

Group assessment

On successful completion you will be able to:

- Critically evaluate data requirements to generate predictive models that support decision-making.
- Critically evaluate and apply advanced predictive analytics techniques to solve complex business problems.
- Devise and implement optimised computer algorithms to develop predictive analytics with efficiency and accuracy.
- Demonstrate an advanced understanding of contemporary analytical techniques and their application in solving problems.
- Collaborate effectively in diverse teams to develop predictive models for real-world business applications.

Formal examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 30 hours
Due: **Exam Period**
Weighting: **40%**
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 2-hour exam with 10 minutes reading time, 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:

- Critically evaluate data requirements to generate predictive models that support decision-making.
- Critically evaluate and apply advanced predictive analytics techniques to solve complex business problems.
- Devise and implement optimised computer algorithms to develop predictive analytics with efficiency and accuracy.
- Demonstrate an advanced understanding of contemporary analytical techniques and their application in solving problems.

Professional practice: Modelling analysis 1

Assessment Type [1]: Problem-based task
Indicative Time on Task [2]: 15 hours
Due: **04/09/2026**
Weighting: **30%**
Groupwork/Individual: Individual
Short extension [3]: Yes
AI Approach: Open AI

The purpose of this assessment is for you to develop and demonstrate your ability to solve complex predictive modelling problems using Python, aligned with industry practices.

You will work with a messy dataset to clean the data, build and implement predictive models using Python, and generate accurate forecasts. You will also interpret and discuss your results.

Skills in focus:

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

Deliverable(s): Modelling task

Individual assessment

On successful completion you will be able to:

- Critically evaluate data requirements to generate predictive models that support decision-making.
- Critically evaluate and apply advanced predictive analytics techniques to solve complex business problems.
- Devise and implement optimised computer algorithms to develop predictive analytics with efficiency and accuracy.
- Demonstrate an advanced understanding of contemporary analytical techniques and their application in solving problems.

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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
- 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

As per iLearn

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 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