BUSA3020

Advanced Analytics Techniques

Session 1, In person-scheduled-weekday, North Ryde 2025

Department of Actuarial Studies and Business Analytics

Contents

General Information	2
Learning Outcomes	2
Assessment Tasks	3
Delivery and Resources	5
Unit Schedule	5
Policies and Procedures	5

General Information

Unit convenor and teaching staff
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Credit points
10

Prerequisites
(STAT2170 or STAT2372) and BUSA2020

Corequisites

Co-badged status

Unit description
This is an advanced applied-skills unit which extends concepts and analytical techniques from earlier units. Students will use data to create graphical representations of data for analysis. Students will clean data in commonly-used spreadsheet formats and make extensive use of proprietary software from big-data orientated companies. Students will develop skills in data visualisation that can be applied to competitive behaviour, target customer analysis, criminology and security intelligence problems.

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: Develop sound solutions to a range of business problems using an analytical approach.

ULO2: Demonstrate competence in applying basic forecasting techniques to a range of business issues.

ULO3: Apply critical thinking to strategy in analysing firm behaviour.

ULO4: Analyse contemporary challenges commonly facing business organisations and how to respond to them.

ULO5: Successfully work in teams to achieve group and organizational objectives

Assessment Tasks

Name	Weighting	Hurdle	Due
Predictive Analytics and dealing with messy data	15%	No	Week 6
Clustering & Segmentation	15%	No	Week 10
Group Project	30%	No	Week 13
Final Exam	40%	No	University Exam Period

Predictive Analytics and dealing with messy data

Assessment Type [1]: Practice-based task
Indicative Time on Task [2]: 20 hours
Due: **Week 6**
Weighting: **15%**

1) Implementing multiple predictive models to forecast a target variable. Comparing and contrasting forecasting performances.

2) Data cleaning, encoding ordinal and nominal variable, and dealing with missing values. Making forecasts based on messy datasets.

On successful completion you will be able to:

- Develop sound solutions to a range of business problems using an analytical approach.
- Demonstrate competence in applying basic forecasting techniques to a range of business issues.
- Apply critical thinking to strategy in analysing firm behaviour.
- Analyse contemporary challenges commonly facing business organisations and how to respond to them.

Clustering & Segmentation

Assessment Type [1]: Practice-based task
Indicative Time on Task [2]: 15 hours
Due: **Week 10**
Weighting: **15%**

Applying appropriate clustering techinques to find meaningful groups and make business recommendations based on the found relationship.

On successful completion you will be able to:

- Demonstrate competence in applying basic forecasting techniques to a range of business issues.
- Apply critical thinking to strategy in analysing firm behaviour.
- Analyse contemporary challenges commonly facing business organisations and how to respond to them.

Group Project

Assessment Type [1]: Report
Indicative Time on Task [2]: 30 hours
Due: **Week 13**
Weighting: **30%**

Data wrangling and Predictive analysis: Group will work together on an allocated project/case and submit python code, recorded video explanations of their solutions and a written group report.

On successful completion you will be able to:

- Develop sound solutions to a range of business problems using an analytical approach.
- Apply critical thinking to strategy in analysing firm behaviour.
- Analyse contemporary challenges commonly facing business organisations and how to respond to them.
- Successfully work in teams to achieve group and organizational objectives

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **University Exam Period**
Weighting: **40%**

A final exam to be held during exam period.

On successful completion you will be able to:

- Demonstrate competence in applying basic forecasting techniques to a range of business issues.
- Apply critical thinking to strategy in analysing firm behaviour.
- Analyse contemporary challenges commonly facing business organisations and how to respond to them.

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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

Classes

- Number and length of classes: 3 hours face-to-face teaching per week, consisting of one 2 hour lecture and one 1 hour computer lab/tutorial.

Recommended Textbook

- *Python Machine Learning* (Third Edition) by Raschka and Mirjalili

Technology Used and Required

- You will need a decent quality laptop (a tablet is not sufficient)

Unit Schedule

Will be provided on 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.

- 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 the Service Connect Portal, 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 2025.04 of the Handbook