



# BUSA3020

## Advanced Analytics Techniques

Session 1, In person-scheduled-weekday, North Ryde 2024

*Department of Actuarial Studies and Business Analytics*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

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Credit points

10

Prerequisites

(STAT270 or STAT2170) and (MGMT220 or 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                  |
|--|-----------|--------|----------------------|
| <a href="#">Clustering &amp; Segmentation</a>                    | 15%       | No     | Week 11              |
| <a href="#">Predictive Analytics and dealing with messy data</a> | 15%       | No     | Week 7               |
| <a href="#">Final Exam</a>                                       | 40%       | No     | Official Exam Period |
| <a href="#">Group Project</a>                                    | 30%       | No     | Week 13              |

### Clustering & Segmentation

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Week 11**

Weighting: **15%**

Applying appropriate clustering techniques 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.

### Predictive Analytics and dealing with messy data

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 7**

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.

## Final Exam

Assessment Type **1**: Examination

Indicative Time on Task **2**: 20 hours

Due: **Official 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.

## 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
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<sup>1</sup> 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.

<sup>2</sup> 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 1 x 2 hour lecture and 1 x 1 hour tutorial.

### Recommended Textbook

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

### Technology Used and Required

- **You will need a decent quality laptop**
- Students will use Python and Jupyter Lab

## Unit Schedule

Available on iLearn.

## 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 [ask.mq.edu.au](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.

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Unit information based on version 2024.04 of the [Handbook](#)