



# BUSA3020

## Advanced Analytics Techniques

Session 1, In person-scheduled-weekday, North Ryde 2023

*Department of Actuarial Studies and Business Analytics*

### Contents

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<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	2
<a href="#"><u>General Assessment Information</u></a>	3
<a href="#"><u>Assessment Tasks</u></a>	3
<a href="#"><u>Delivery and Resources</u></a>	5
<a href="#"><u>Unit Schedule</u></a>	5
<a href="#"><u>Policies and Procedures</u></a>	6

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff Unit Convenor George Milunovich <a href="mailto:george.milunovich@mq.edu.au">george.milunovich@mq.edu.au</a>
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.

## 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
<a href="#">Predictive Analytics</a>	20%	No	Refer to iLearn
<a href="#">Clustering &amp; Segmentation</a>	20%	No	Refer to iLearn
<a href="#">Social Network Analysis</a>	20%	No	Refer to iLearn
<a href="#">Group Project</a>	40%	No	Refer to iLearn

### Predictive Analytics

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

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

Due: **Refer to iLearn**

Weighting: **20%**

Data extraction, visualisation and assessment of alternative software: Use prediction tools from two or more alternative software programs to recommend which program is most useful to a client.

On successful completion you will be able to:

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

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

Due: **Refer to iLearn**

Weighting: **20%**

Use appropriate data reduction tools to create a data set with a manageable number of variables, then use appropriate clustering tools to find meaningful groups.

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.

## Social Network Analysis

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

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

Due: **Refer to iLearn**

Weighting: **20%**

Data visualisation and key node identification, with explanatory notes.

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.

## Group Project

Assessment Type <sup>1</sup>: Report

Indicative Time on Task <sup>2</sup>: 35 hours

Due: **Refer to iLearn**

Weighting: **40%**

Data wrangling and Predictive analysis: Group will work together on an allocated project/case and submit a 1,000 - 1,500 word 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.

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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.
- The timetable for classes can be found on the University web site at: <http://www.timetables.mq.edu.au/>

### Recommended Textbook

- *Python Machine Learning* (Third Edition) by Raschka and Mirjalili
- *Business Analytics A Management Approach*, 2019, Vidgen, Kirshner & Tan, Macmillan International Paperback - 9781352007251

### Technology Used and Required

- **You will need a decent quality laptop (a tablet will not be enough)**
- Students will mainly use Python and Jupyter Lab
- Other technologies that may be used include Data Mining/Analytics packages

## 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.