



BUSA3020

Advanced Analytics Techniques

Session 1, Weekday attendance, North Ryde 2020

Department of Actuarial Studies and Business Analytics

Contents

| | |
|---|---|
| <u>General Information</u> | 2 |
| <u>Learning Outcomes</u> | 2 |
| <u>General Assessment Information</u> | 3 |
| <u>Assessment Tasks</u> | 3 |
| <u>Delivery and Resources</u> | 4 |
| <u>Unit Schedule</u> | 5 |
| <u>Policies and Procedures</u> | 6 |
| <u>Changes from Previous Offering</u> | 8 |
| <u>Global Contexts and Sustainability</u> | 8 |
| <u>Research and Practice</u> | 8 |
| <u>Changes since First Published</u> | 8 |

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General Information

Unit convenor and teaching staff

Lecturer

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Contact via eMail

Room 732, 4 Eastern Road

11:00 to 13:00, Thursdays

Angela Chow

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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.

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

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

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

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult [iLearn](#) for revised unit information.

[Find out more about the Coronavirus \(COVID-19\) and potential impacts on staff and students](#)

General Assessment Information

Assessment Marks

It is the responsibility of students to view their marks for each within session assessment on iLearn within 20 working days of posting. If there are any discrepancies, students must contact the unit convenor immediately. Failure to do so will mean that queries received after the release of final results regarding assessment marks (not including the final exam mark) will not be addressed.

Special Consideration

Where a Special Consideration application is approved, the student may be offered an alternative assessment or may receive a mark based on the percentage mark achieved by the student in one or more other assessment tasks, at the Unit Convenor's discretion.

Late Penalties

Tasks 10% or less – No extensions will be granted. Students who have not submitted the task prior to the deadline will be awarded a mark of 0 for the task, except for cases in which an application for special consideration is made and approved.

Tasks above 10% - No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 20% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. No submission will be accepted after solutions have been posted.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

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/>

Textbook

- '*Advanced Analytics Methodologies: Driving Business Value with Analytics*', Michele Chambers, Thomas W Dinsmore, **Pearson** ISBN-13: 978-0133498608, ISBN-10: 0133498603

Technology Used and Required

Students will learn to use spreadsheet (*MS-Excel*), Tableau and Gephi. Students will choose to become intermediate-skilled at one of the existing Data Mining/ Analytics packages, such as SPSS Modeler, RapidMiner, Orange, Knime, R statistical package, and others. They will also be exposed to data editing software such as OpenRefine, EasyMorph and Tableau Data Editor.

Unit Web Page

The web page for this unit can be found at: [iLearn http://ilearn.mq.edu.au](http://ilearn.mq.edu.au)

Teaching and Learning Strategy

This unit is lecture- and tutorial-based. Typically, the class-time structure will be like this:

- **Lectures:** We will establish links between theory and your personal knowledge from your previous units during class discussions, and then integrate these with applied exercises.
- **Tutorials:** students are required to work on some tasks using appropriate models and techniques. Student participation and meaningful contribution are essential to understand analytics concepts and techniques.

Lecture notes will be posted after each lecture on [iLearn](http://ilearn.mq.edu.au)

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult [iLearn](#) for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Unit Schedule

Time spent on individual topics and exercises may change as we progress during the semester, so some topics may vary from this schedule.

| Week # | Topic | Notes |
|--------|--|---|
| 1 | Why is analytics so important to business? (Chambers & Dinsmore, Chapter 4) Define Business needs (chapter 5/8) Social Network Analysis | (27 February) Assignment: Social Network Analysis briefing |
| 2 | Social Network Analysis continued | (5 March) |
| 3 | Determine the analytic application/key audience (Chambers & Dinsmore, Chapter 6) Linear Models | (12 March) Assignment: Predictive Analytics briefing Assignment: Social Network Analysis due 23:55 Friday 13 March |
| 4 | Build the Analysis data set (Chambers & Dinsmore, Chapter 8) Build & Deploy the predictive model | (19 March) <i>(Heads-up: Professor Winzar may be away this week.)</i> |
| 5 | Assignment 1 presentations Overview Predictive Analytics Techniques (Chambers & Dinsmore, Chapter 9) Linear Models | (26 March) Linking business objectives to predictor value. Introducing software: SPSS Modeler, Rapidminer, WEKA, Orange, and others |
| 6 | Neural Networks & Automated learning (Chambers & Dinsmore, Chapter 9 and Appendix A) Non-linear models, Neural Networks, and exotica | (2 April) Assignment: Predictive Analytics due 23:55 Friday 3 April |
| 7 | Assignment: Predictive Analytics presentations Clustering techniques | (9 April) Assignment: Clustering & Segmentation briefing |

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| 8 | Data Reduction Simplifying data for Clustering | (30 April) |
| 9 | More on Clustering techniques Ethical issues in data gathering and processing | (7 May) Assignment: Clustering & Segmentation due 23:55 Friday 8 May |
| 10 | Assignment: Clustering & Segmentation presentations | (14 May) Assignment Group Project briefing |
| 11 | Combining analytical techniques | (21 May) |
| 12 | Group project consultation session | (28 May) |
| 13 | Assignment 4 presentations | (4 June) Assignment Group Project: due 23:55 Friday 5 June |

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of

Conduct: <https://students.mq.edu.au/study/getting-started/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 or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [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

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

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.

Changes from Previous Offering

Some minor changes to assessment criteria, and more details on assessment expectations.

Global Contexts and Sustainability

This unit teaches Analytics that can be applied in a global context.

Research and Practice

- This unit includes research by the unit lecturer and other Macquarie University researchers
- This unit uses research from external sources.
- This unit gives you opportunities to learn how to critique current research at the frontiers of your discipline as a prelude to later conducting your own research.

Changes since First Published

| Date | Description |
|------------|--|
| 07/02/2020 | Minor adjustment to general assessment information |