



# MMBA8160

## Data and Business Analytics

Term 4, Special circumstances 2021

*Department of Actuarial Studies and Business Analytics*

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#### **Disclaimer**

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#### **Session 2 Learning and Teaching Update**

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of [units with mandatory on-campus classes/teaching activities](#).

Visit the [MQ COVID-19 information page](#) for more detail.

## General Information

Unit convenor and teaching staff

John Croucher

[john.croucher@mq.edu.au](mailto:john.croucher@mq.edu.au)

Credit points

10

Prerequisites

Admission to MBA or PGDipMgt or GradDipMgt or MSocEntre or GradCertSocEntre

Corequisites

Co-badged status

Unit description

This unit provides quantitative/statistical research tools, data analysis and computer modelling necessary to help the modern business manager with strategic planning, tactical decision-making, and resolving business problems. It also covers the efficient use of all resources to enhance management effectiveness. The overall aim is to improve the reliability of decisions made and to develop better strategy through the use of scientific method.

## 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:** Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.

**ULO2:** Use appropriate quantitative research tools, evaluate and synthesise quantitative data to help assess the implications of strategic decisions from a whole of entity perspective, and across a wide spectrum of stakeholders.

**ULO3:** Critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable from a quantitative point of view.

**ULO4:** Apply a range of research tools and models of business performance and productivity to measure and track sustainable value creation across organisational

processes and projects.

## General Assessment Information

Assessment criteria for all assessment tasks will be provided on the unit iLearn site.

It is the responsibility of students to view their marks for each within-session-assessment on iLearn within 20 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 tasks (not including the final exam mark) will not be addressed.

### Late submissions and extensions

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.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#"><u>Final Exam</u></a>	60%	No	During the final exam period
<a href="#"><u>Individual Assignment</u></a>	40%	No	No later than 7.00pm on Thursday 11 November 2021

### Final Exam

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

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

Due: **During the final exam period**

Weighting: **60%**

An open book two-hour exam will be held during the University Examination Period.

On successful completion you will be able to:

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.

- Use appropriate quantitative research tools, evaluate and synthesise quantitative data to help assess the implications of strategic decisions from a whole of entity perspective, and across a wide spectrum of stakeholders.
- Critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable from a quantitative point of view.
- Apply a range of research tools and models of business performance and productivity to measure and track sustainable value creation across organisational processes and projects.

## Individual Assignment

Assessment Type <sup>1</sup>: Programming Task

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **No later than 7.00pm on Thursday 11 November 2021**

Weighting: **40%**

Students will be required to practice what they have learned by completing the assignment.

On successful completion you will be able to:

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.
- Use appropriate quantitative research tools, evaluate and synthesise quantitative data to help assess the implications of strategic decisions from a whole of entity perspective, and across a wide spectrum of stakeholders.
- Critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable from a quantitative point of view.
- Apply a range of research tools and models of business performance and productivity to measure and track sustainable value creation across organisational processes and projects.

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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

The textbook for this unit is:

**Croucher, John. S. (2020). Quantitative Analysis for Management, 6th edition. McGraw-Hill Education. ISBN: 9781760425029**

**You should have this textbook with you for all lectures as it is also a workbook and will be referred to by the lecturer..**

**Please note:** Students should only attain the 6th edition of this textbook, which is the only edition this class will be taught from. Furthermore, this course relies heavily on the learning material provided in the textbook (which also acts as an exercise book for in-class demonstration and activities). It is highly advised that students attain the required textbook as soon as possible and familiarise themselves with the textbook material, especially before the start of each class session for sessions with specific allocated chapters (which is made available in the unit schedule below as well as the class iLearn page).

## Where to purchase the textbook?

**McGraw Hill Education Australia – Online store:** This textbook is also available for order via the publisher's online store. For information on textbook prices and online ordering, please refer to the McGraw Hill Education Australia online store at <https://www.mheducation.com.au/quantitative-analysis-for-management-6e-9781760425029-aus>

## Additional Recommended Text

The text listed below are optional only. It is not compulsory to attain a copy.

- Croucher, John S. (2016). Introductory mathematics and statistics for business (6th edition- revised). McGraw-Hill.
- Render, B., Stair, R., Hanna, M.E. and Hale, T.S. (2018). Quantitative analysis for management (13th edition). Pearson.
- Bowerman, B.L., O'Connell, R. and Murphree, E. (2016). Business statistics in practice (8th edition). McGraw-Hill

## Calculator

A basic calculator with specific keys shown below is required in this unit since it will be used in all class tests and final exam. You may find it useful, but it is not necessary, to have a statistical calculator that has in-built statistical functions. There are several types of these:

- The lowest level statistical calculator has function keys such as the mean and standard deviation but no other statistical function keys.

- The next level above also has function keys for correlation and linear regression. An example is one of the Casio *fx* series such as the 82 or 100 series, but there are many others.

In any case, your calculator should include the following keys:

$x!$      $e^x$      $nCr$

You need to bring your calculator to every session class.

## Access to Technology

Access to a personal computer and internet connection is required to access learning material/resources online on Macquarie University's online learning management system called iLearn.

Students will also be required to gain access to statistical software called **Minitab 19**. This can be downloaded from the iLearn web page, along with the 2020 licence file. The unit will also use the data analysis section of *Microsoft Excel* for some topics.

## Unit Schedule

### Session 1

- Introduction to statistics - ch 1.1
- Sampling procedures - ch 1.2 - 1.3
- Summarising data - ch 1.4 - 1.7
- Measures of centre - ch 1.8 - 1.14
- Other statistical measures - ch 1.13 - 1.14, 1.16, 1.18 - 1.19
- Data analytics - ch 1.20

### Session 2

- Measures of variation - ch 2.1 - 2.3, 2.5 - 2.7
- Using Microsoft Excel - ch 2.9
- Using Minitab - ch 2.11
- Normal distribution - ch 2.13
- Areas under the normal curve - ch 2.14 - 2.18
- Applications - ch 2.19

### Session 3

- Estimation - ch 3.1 - 3.3
- Confidence intervals - ch 3.4 - 3.10
- Random variables - ch 3.13 - 3.16
- Factorials, permutations and combinations - ch 3.17 - 3.19
- Lotto type games - ch 3.20

#### Session 4

- Correlation - ch 4.1 - 4.8
- Time series models - ch 4.9 - 4.11
- Regression models - ch 4.12 - 4.19

#### Session 5

- Exponential smoothing models - ch 4.23 - 4.28
- Seasonal data - ch 4.29 - 4.30
- Lag effects - ch 4.31 - 4.33
- Categorical data - ch 5.1 - 5.3
- Single variable data - ch 5.4 - 5.7
- Contingency tables - ch 5.8 - 5.10

#### Session 6

- Introduction to hypothesis testing - ch 6.1 - 6.5
- Power of a test - ch 6.6
- One-sample tests - ch 6.7 - 6.12
- Using Minitab - ch 6.13 - 6.16

#### Session 7

- Analysis of variance (one-way) - ch 8.1 - 8.3, 8.5
- Multiple comparisons - ch 8.8 - 8.9
- Analysis of variance (two-way) - ch 8.10
- Using Minitab - ch 8.11
- Visual displays - ch 8.13 - 8.19

#### Session 8

- Odds and probability - ch 9.1 - 9.3
- Odds ratios - ch 9.4
- Binary logistics regression - Single covariate - ch 9.5 - 9.7
- Using Minitab - ch 9.8 - 9.9
- Testing of parameters - ch 9.10 - 9.12
- Binary logistic regression - Multiple covariate - ch 9.13

#### Session 9

- Queueing systems - ch 12.1
- Definitions and parameters - ch 12.2 - 12.9
- A simple queue - ch 12.10

- Calculation of probabilities and outcomes - ch 12.11, 12.13 - 12.14
- Multiple server queues - ch 12.16 - 12.22

### Session 10

- General course summary
- Individual assignment solutions
- Case studies
- Outline of the final examination

## 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](#)
- [Grade Appeal Policy](#)
- [Complaint Management 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](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](http://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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.