



# MGNT604

## Managing Data

Term 2 North Ryde 2019

*Department of Actuarial Studies and Business Analytics*

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### Disclaimer

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## General Information

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Credit points

4

Prerequisites

Admission to MMgmt

Corequisites

Co-badged status

Unit description

This unit provides the quantitative/statistical research tools, data analysis and computer modelling necessary to assist managers with strategic planning, tactical decision-making, and resolving business problems. It also covers the efficient use of resources to enhance organizational effectiveness. The overall aim is to show how to build models of real business situations that allow decision-makers to better understand the structure of decisions, to automate the decision process by using computer decision tools, and to improve the reliability of decisions made.

## 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:

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

Using 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.

From a quantitative point of view, critically assess and integrate ethical, social and

environmental factors into business decision-making and management practices that are also commercially viable.

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.

## Assessment Tasks

| Name                         | Weighting | Hurdle | Due                          |
|------------------------------|-----------|--------|------------------------------|
| <u>Individual assignment</u> | 20%       | No     | Session 7                    |
| <u>In-class test</u>         | 20%       | No     | Session 10                   |
| <u>Final examination</u>     | 60%       | No     | Exam week: 10 - 15 June 2019 |

### Individual assignment

Due: **Session 7**

Weighting: **20%**

**Format:** Question set

In order to properly understand the material covered in the course, it is necessary for you to practice what you have learned. The individual assignment (and exercises) provides an opportunity for you to gain experience in the techniques and concepts. There is only one individual assignment that you should do by yourself. It covers what you have learned in the lectures up to and including session 4.

The solutions to this assignment will be discussed during the final lecture and also placed on the iLearn class page.

#### **Extensions and penalties:**

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.

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.
- Using 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.

- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

## In-class test

Due: **Session 10**

Weighting: **20%**

**Duration:** 1 hour

**Format:** Open book test

The in-class test will be held under exam conditions during the specified class session above and will include the material covered in sessions 1 - 6. It will consist of ten short answer/multiple choice questions. Notebook computers, iPads, tablets, PDAs and similar are not allowed.

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.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

## Final examination

Due: **Exam week: 10 - 15 June 2019**

Weighting: **60%**

**Duration:** 3 hours plus 10 minutes reading time

**Format:** Open book final examination

You are expected to present yourself for examination at the time and place designated in the

MGSM examination timetable. The timetable will be available on 17 April 2019 at <https://students.mgsm.edu.au/sydney-students/units/exams/>.

The exam format will be **open book**, and will consist of a combination of multiple choice, short answer and problem solving style questions. More details on the exam will be provided in class. The final examination will cover all topics dealt within the unit. You can use books, notes and a non-programmable calculator. Notebook computers, iPads, tablets, PDAs and similar are not allowed.

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.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

## Delivery and Resources

### Required text

Croucher, John. S. (2018). Quantitative Analysis for Management, 5th edition. McGraw-Hill Education. ISBN: 9781760423834

**You should bring this textbook to all lectures as it is also a workbook.**

### Where to purchase textbook?

**The Coop Bookshop:** The Coop Bookshop is our main retailer for textbooks and other related academic material. For information on textbook prices and online ordering, please refer to The Co-Op Bookshop webpage at <http://www.coop.com.au>

**Disclaimer:** MGSM does not take responsibility for the stock levels of required textbooks from preferred retail outlets and other book retailers. While we advise our preferred book retail outlet, The Co-op Bookshop, of our maximum expected number of students purchasing specific required text each term, The Co-op Bookshop and other book retailers will make their own judgement in regard to their physical holding stock levels. To prevent disappointment if a textbook is out-of-stock, we highly advise students to order their textbooks as early as possible, or if the required textbook is currently out-of-stock, place an order with the book retailer as soon as possible so that these book retailers can monitor demand and supply, and adjust their stock

orders accordingly.

## 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. (2015). Quantitative analysis for management (12th edition). Pearson.
- Bowerman, B.L., O'Connell, R. and Murphree, E. (2013). Business statistics in practice (7th 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:

$x!$      $e^x$      ${}^nC_r$

You need to bring your calculator to every session class.

## MGSM iLearn

The web page for this unit can be found at: <https://ilearn.mq.edu.au/login/MGSM>

As an enhancement to this unit, there is a series of multiple choice and short answer questions that you may try on iLearn, Macquarie University's online learning management system. Answers will also be provided on iLearn. To access these, just log in via the link above.

The purpose of these questions is for practice only. They will not be used for assessment purposes but is hoped that you will attempt them for your own benefit.

For any enquiries regarding difficulties accessing these questions please contact Mr Ariel Alcantara on email at: [ariel.alcantara@mgsm.edu.au](mailto:ariel.alcantara@mgsm.edu.au).

## Technology

Access to a personal computer is required to access resources and learning material from iLearn.

Students will also be required to gain access to statistical software called Minitab 16. While the text refers to Minitab 16, version 17 & 18 may be used. Further instructions are provided in the class iLearn page.

## Unit Schedule

**Students are required to attend all classes.** Please only attend the class you are enrolled in as reflected in your e-Student account. This unit will be presented over 10 sessions as follows (*The proposed program might be subject to some minor changes as the term progresses (TBA)*).

**Class sessions are scheduled from:** 6pm to 10pm of every Wednesday starting from 3 April 2019 (session 1) until 5 June 2019 (session 10).

**Final exam week:** 10 - 15 June 2019 (The exam timetable will be available on 17 April 2019 at <https://students.mqsm.edu.au/sydney-students/units/exams/>)

| Session | Topics and textbook chapters covered  |
|---------|---|
| 1       | <ul style="list-style-type: none"> <li>• Introduction to statistics - ch 1.1</li> <li>• Sampling procedures - ch 1.2 - 1.3</li> <li>• Summarising data - ch 1.4 - 1.7</li> <li>• Measures of centre - ch 1.8 - 1.14</li> <li>• Other statistical measures - ch 1.13 - 1.14, 1.16, 1.18 - 1.19</li> <li>• Big data - ch 1.20</li> </ul>  |
| 2       | <ul style="list-style-type: none"> <li>• Measures of variation - ch 2.1 - 2.3, 2.5 - 2.7</li> <li>• Using Microsoft Excel - ch 2.9</li> <li>• Using Minitab - ch 2.11</li> <li>• Normal distribution - ch 2.13</li> <li>• Areas under the normal curve - ch 2.14 - 2.18</li> <li>• Applications - ch 2.19</li> </ul>  |
| 3       | <ul style="list-style-type: none"> <li>• Monitoring Business Processes – Lecture notes to be provided in iLearn</li> <li>• Central Limit Theorem</li> <li>• Common cause and special cause variation</li> <li>• Statistical Process Control Using Minitab               <ul style="list-style-type: none"> <li>◦ Continuous Charts</li> <li>◦ Attribute Charts</li> </ul> </li> </ul> |
| 4       | <ul style="list-style-type: none"> <li>• Estimation - ch 3.1 - 3.3</li> <li>• Confidence intervals - ch 3.4 - 3.10</li> <li>• Random variables - ch 3.13 - 3.16</li> <li>• Factorials, permutations and combinations - ch 3.17 - 3.19</li> <li>• Lotto type games - ch 3.20</li> </ul>  |

|    |   |
|----|---|
| 5  | <ul style="list-style-type: none"> <li>• Correlation - ch 4.1 - 4.8</li> <li>• Time series models - ch 4.9 - 4.11</li> <li>• Regression models - ch 4.12 - 4.19</li> <li>• Exponential smoothing models - ch 4.23 - 4.28</li> <li>• Seasonal data - ch 4.29 - 4.30</li> <li>• Lag effects - ch 4.31 - 4.33</li> </ul>   |
| 6  | <ul style="list-style-type: none"> <li>• Categorical data - ch 5.1 - 5.3</li> <li>• Single variable data - ch 5.4 - 5.7</li> <li>• Contingency tables - ch 5.8 - 5.10</li> </ul>  |
| 7  | <ul style="list-style-type: none"> <li>• Introduction to hypothesis testing - ch 6.1 - 6.5</li> <li>• Power of a test - ch 6.6</li> <li>• One-sample tests - ch 6.7 - 6.12</li> <li>• Using Minitab - ch 6.13 - 6.16</li> </ul>   |
| 8  | <ul style="list-style-type: none"> <li>• Analysis of variance (one-way) - ch 8.1 - 8.3, 8.5</li> <li>• Multiple comparisons - ch 8.8 - 8.9</li> <li>• Analysis of variance (two-way) - ch 8.10</li> <li>• Using Minitab - ch 8.11</li> <li>• Visual displays - ch 8.13 - 8.19</li> </ul>  |
| 9  | <ul style="list-style-type: none"> <li>• Odds and probability - ch 9.1 - 9.3</li> <li>• Odds ratios - ch 9.4</li> <li>• Binary logistics regression - Single covariate - ch 9.5 - 9.7</li> <li>• Using Minitab - ch 9.8 - 9.9</li> <li>• Testing of parameters - ch 9.10 - 9.12</li> <li>• Binary logistic regression - Multiple covariate - ch 9.13</li> </ul> |
| 10 | <ul style="list-style-type: none"> <li>• General course summary</li> <li>• Case studies</li> <li>• Artificial Intelligence and Machine learning tools - Demonstration</li> <li>• Outline of the final examination</li> </ul>  |

## 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.)

Undergraduate 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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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](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)

## 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 improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## 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.

## Graduate Capabilities

### Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

#### Learning outcomes

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

#### Assessment tasks

- Individual assignment
- In-class test
- Final examination

### Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where

relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

## **Learning outcomes**

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

## **Assessment tasks**

- Individual assignment
- In-class test
- Final examination

## **Critical, Analytical and Integrative Thinking**

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## **Learning outcomes**

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and

environmental factors into business decision-making and management practices that are also commercially viable.

- 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.

## **Assessment tasks**

- Individual assignment
- In-class test
- Final examination

## **Problem Solving and Research Capability**

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## **Learning outcomes**

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

## **Assessment tasks**

- Individual assignment
- In-class test
- Final examination

## Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

### Learning outcomes

- Evaluate disparate data and information using appropriate quantitative tools to evidence and formulate well-informed and robust strategic business decisions.
- Using 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.
- From a quantitative point of view, critically assess and integrate ethical, social and environmental factors into business decision-making and management practices that are also commercially viable.
- 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.

### Assessment tasks

- Individual assignment
- In-class test
- Final examination

## Changes from Previous Offering

**Assessment tasks:** None

**Delivery and resources:** None

**Unit schedule:** None

## Alignment of this unit with MGSM's mission-driven attributes

- **Leadership:** The unit develops quantitative skills required of leaders with respect to the wide range of techniques available to deal with array of information in order to make well-informed and robust strategic decisions.

- **Global mindset:** The unit enhanced my ability to assess the implications of strategic decisions from a whole of entity perspective, across of a national and international spectrum of stakeholders.
- **Citizenship:** The unit encouraged me to apply an accurate and fair approach to deriving business strategies and disclosure of any difficulties or ethical issues that may arise from them.
- **Creating sustainable value:** The unit assisted my adoption of a forward-looking perspective on the impact of qualitative decisions and how they may be readily adapted if parameters change in the future.

## Attendance Policy (MGSM)

The interactive environment of the classroom is central to the MGSM experience. Students are required to attend the full duration of all classes for the units in which they are enrolled. We recognise that exceptional circumstances may occur, such as unavoidable travel on behalf of your organization or the serious illness or injury of you or a close family member.

Special consideration may be given for a maximum of 20% non-attendance for such circumstances as long as lecturers are contacted in advance, and supporting documentation provided, to request exemption from attendance. Failure to abide by these conditions may result in automatic withdrawal, with academic and/or financial penalty. The full Student Attendance Policy is published in the MGSM Student Handbook at <https://students.mgsm.edu.au/handbook>.

## Content Disclaimer

These unit materials and the content of this unit are provided for educational purposes only and no decision should be made based on the material without obtaining independent professional advice relating to the particular circumstances involved.