MMBA8160

Data and Business Analytics

Term 1, Online-scheduled-In person assessment, North Ryde 2022

Department of Actuarial Studies and Business Analytics

Contents

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General Information

Unit convenor and teaching staff
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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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Individual Assignment	20%	No	Sunday 20/02/22 1700
In-Class Test	20%	No	Monday 28/02/22 1800-1900
Final Exam	60%	No	Exam week 21/03/22-27/03/22

Individual Assignment

Assessment Type [1]: Programming Task
Indicative Time on Task [2]: 15 hours
Due: **Sunday 20/02/22 1700**
Weighting: **20%**

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.

In-Class Test

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 15 hours
Due: **Monday 28/02/22 1800-1900**
Weighting: **20%**

A one hour open book test will be held in class.

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.

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **Exam week 21/03/22-27/03/22**
Weighting: **60%**

An open book 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.

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[1] 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.

[2] 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

Textbook

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 purchase 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 texts listed below are optional only. It is not compulsory to purchase copies.

• 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   ^nC_r

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 2022 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 • **Individual assignment due**

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 • **In-class test**

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 • 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). 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). 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) 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 or if you are a Global MBA student contact 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 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/.

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.