MMBA8160

Data and Business Analytics

Term 1, Special circumstances 2021

Department of Actuarial Studies and Business Analytics

Contents

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Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to timetable viewer. To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff
John Croucher
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Angela Chow
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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.

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 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.

- In the cases 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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Individual Assignment	40%	No	Via iLearn no later than 5.00pm on Monday 1 March 2021
Final Exam	60%	No	During the final examination period

Individual Assignment

Assessment Type [1]: Programming Task
Indicative Time on Task [2]: 30 hours
Due: **Via iLearn no later than 5.00pm on Monday 1 March 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.

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **During the final examination period**
Weighting: **60%**

An open book three hour online 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

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 Zoom classes 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!   *ex*   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 16**. 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

MMBA8160 Data and Business Analytics

Remote Delivery Mode via Zoom

Unit Convenor – Professor John Croucher

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
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- **Session 3**

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  - ◦ 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

- Case studies

- Outline of the final examination

- Trial quiz (not for assessment)

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

- 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). 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

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.