



# MMBA8160

## Information and Decision Analysis

MGSM term 3, Special circumstance 2020

*Department of Actuarial Studies and Business Analytics*

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## General Information

Unit convenor and teaching staff Brad Smith <a href="mailto:brad.smith@mq.edu.au">brad.smith@mq.edu.au</a>  Angela Chow <a href="mailto:angela.chow@mq.edu.au">angela.chow@mq.edu.au</a>
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	40%	No	07/08/2020
Final Exam	60%	No	Exam Week - to be advised

### Individual Assignment

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

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

Due: **07/08/2020**

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 <sup>1</sup>: Examination

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

Due: **Exam Week - to be advised**

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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<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**

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

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

**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:

$x!$       $e^x$       ${}^nC_r$

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 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

**MMBA8160 Information and Decision Analysis**

## **Remote Delivery Mode - Timetable**

### **Unit Convenor – Brad Smith**

The course timings and pre-work for each Zoom class is below. Further information about the zoom 'live' sessions will be provided prior to the first class on the Tuesday 23<sup>rd</sup> June 2020.

Students should do the pre-work prior to attending the "live" Zoom sessions scheduled at the times below. (\* Note: Finish time for Zoom sessions is approximate and will be driven by student demand and involvement.)

Completion of the Class worksheets is optional, before the Zoom session. Some time will be provided in the Zoom sessions for you to do them and the answers will be detailed in these sessions.

<b>Tuesday 23<sup>rd</sup> June</b>	<b>6pm – 7:30 pm – Sydney time (via zoom)</b>
<b>Session 1</b>	<b>Course Introduction and Assessments</b> <b>Descriptive Statistics</b>

Pre-work:	<p><b><u>Powerpoint Videos - (Links also in i-Learn)</u></b></p> <p><b>Session 1.0 Introduction</b></p> <p><a href="https://macquarie.zoom.us/rec/share/_vZIMrPZ2XfIX4HftF7RdJc9PZXdX6a81Sca8vsLyB2B6D6vWQeJkY1l_xneYw6?startTime=1585452259000">https://macquarie.zoom.us/rec/share/_vZIMrPZ2XfIX4HftF7RdJc9PZXdX6a81Sca8vsLyB2B6D6vWQeJkY1l_xneYw6?startTime=1585452259000</a></p> <p><b>Session 1.1 Course Introduction</b></p> <p><a href="https://macquarie.zoom.us/rec/share/_dReCu777TpJTKfhuUTfYKs5EZ3YT6a81XNL-vllmhkPPgW12WJavprigO2noWsC?startTime=1585472900000">https://macquarie.zoom.us/rec/share/_dReCu777TpJTKfhuUTfYKs5EZ3YT6a81XNL-vllmhkPPgW12WJavprigO2noWsC?startTime=1585472900000</a></p> <p><b>Session 1.2: Introduction and Course Overview - Why Study IDA?</b></p> <p><a href="https://macquarie.zoom.us/rec/share/4NMuF6jw915lQreS7k-Ac_clJY3VX6a81iEbrPoLzx5mTk2PIGCvhfaBStlvP5DL?startTime=1585532197000">https://macquarie.zoom.us/rec/share/4NMuF6jw915lQreS7k-Ac_clJY3VX6a81iEbrPoLzx5mTk2PIGCvhfaBStlvP5DL?startTime=1585532197000</a></p> <p><b>Session 1.3 : Introduction to Statistics, Sampling Procedures and Visually Summarising Data</b></p> <p><a href="https://macquarie.zoom.us/rec/share/wd0lDe-p8nFJaK_M526YA6xiLo_Jeaa8gSdl_qUKyU0XACLa_iNvgiMjr8levTxL?startTime=1585542996000">https://macquarie.zoom.us/rec/share/wd0lDe-p8nFJaK_M526YA6xiLo_Jeaa8gSdl_qUKyU0XACLa_iNvgiMjr8levTxL?startTime=1585542996000</a></p> <p><b>Session 1.4 : Introduction to Statistics Numerical Summaries of Data-Central Tendency</b></p> <p><a href="https://macquarie.zoom.us/rec/share/z-NEBrTy9HxLcoXS52PuRa4RP8PBeaa80ChPq_AOnUxCct7VKrmEm12z-NIA7bT-?startTime=1585608114000">https://macquarie.zoom.us/rec/share/z-NEBrTy9HxLcoXS52PuRa4RP8PBeaa80ChPq_AOnUxCct7VKrmEm12z-NIA7bT-?startTime=1585608114000</a></p> <p><b>Session 1.5 : Introduction to Statistics Numerical Summaries of Data Quartiles and Boxplots</b></p> <p><a href="https://macquarie.zoom.us/rec/share/v8lvP4z173NLGKfDsHjBQZUEGY3Zeaa80XcZ_PdfxRqDwjbeDi4NO6KmQBli_yQ6?startTime=1585613487000">https://macquarie.zoom.us/rec/share/v8lvP4z173NLGKfDsHjBQZUEGY3Zeaa80XcZ_PdfxRqDwjbeDi4NO6KmQBli_yQ6?startTime=1585613487000</a></p> <p><b>Session 1.6 : Introduction to Statistics-Numerical Summaries of Data-Variation</b></p> <p><a href="https://macquarie.zoom.us/rec/share/5vVLBKnhRhxJAa-O2kPyQL4rPlvlaaa8g3Uc-PsFxUseOVk8HVanHTnh6kcL5qA8?startTime=1585626337000">https://macquarie.zoom.us/rec/share/5vVLBKnhRhxJAa-O2kPyQL4rPlvlaaa8g3Uc-PsFxUseOVk8HVanHTnh6kcL5qA8?startTime=1585626337000</a></p> <p><b><u>Text book Readings</u></b></p> <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>• Measures of variation - ch 2.1 - 2.3, 2.5-2.7</li> </ul>
Class Worksheets  (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 1 Handout Download Speeds</li> </ul>
Tuesday 30 <sup>th</sup> June	6pm – 7:30 pm – Sydney time (via zoom)

Session 2	Probability, discrete probability distributions, expected values and decision trees
Pre-work:	<p>Powerpoint Videos - (Links also in i-Learn)</p> <p><b>Session 2.1: Probability Risk and Decisions</b></p> <p><a href="https://macquarie.zoom.us/rec/share/9ZRYJLX-0nJLBYXdq0aEfPYeBJXEX6a8hyRNrKMYU6enO0moA5JZes4sSlwPY5E?startTime=1585694558000">https://macquarie.zoom.us/rec/share/9ZRYJLX-0nJLBYXdq0aEfPYeBJXEX6a8hyRNrKMYU6enO0moA5JZes4sSlwPY5E?startTime=1585694558000</a></p> <p><b>Session 2.2: Independent and Conditional Probability</b></p> <p><a href="https://macquarie.zoom.us/rec/share/6tdINLG31m5LRqfwuW_kAl88PbvAaaa81HdL-voFzdT4S5UzyALHQBbg3VEMzIM?startTime=1585697173000">https://macquarie.zoom.us/rec/share/6tdINLG31m5LRqfwuW_kAl88PbvAaaa81HdL-voFzdT4S5UzyALHQBbg3VEMzIM?startTime=1585697173000</a></p> <p><b>Session 2.3: Probability – Discrete Random Variables and Expected Value</b></p> <p><a href="https://macquarie.zoom.us/rec/share/1esrCq6zp0BOXqfRzED2WfYBPKr9aaa81SFlofslmRIRABAWfXsaWYbgCpXr2vYh?startTime=1585703017000">https://macquarie.zoom.us/rec/share/1esrCq6zp0BOXqfRzED2WfYBPKr9aaa81SFlofslmRIRABAWfXsaWYbgCpXr2vYh?startTime=1585703017000</a></p> <p><b>Session 2.4: Decision Trees</b></p> <p><a href="https://macquarie.zoom.us/rec/share/-s1EFLb99kRLRKPn5WLI5w5H97veaa82yBP8vUNnUumX1hMVacIGUdsugaBv2Rq?startTime=1585708371000">https://macquarie.zoom.us/rec/share/-s1EFLb99kRLRKPn5WLI5w5H97veaa82yBP8vUNnUumX1hMVacIGUdsugaBv2Rq?startTime=1585708371000</a></p> <p><b><u>Text book Readings</u></b></p> <ul style="list-style-type: none"> <li>• Independence – ch -10.1</li> <li>• Conditional Probability – ch 10.11</li> <li>• Random variables with Applications - ch. 3.13 - 3.16</li> </ul>
Class Worksheets (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 2 Probability Distribution Questions</li> <li>• Session 2.1 Random Variable and Expected Value Questions</li> </ul>
Tuesday 7 <sup>th</sup> July	6pm – 7:30 pm – Sydney time (via zoom)



Session 3	Normal distribution, estimation and confidence intervals
Pre-work:	<p><b>Powerpoint Videos</b> - (Links also in i-Learn)</p> <div> <p><b>Session 3.1 The Normal Distribution – Introduction</b></p> <p><a href="https://macquarie.zoom.us/rec/share/tJYuAZHV2E5JH6fs5nvAZoVxlb_LT6a80Xla-qcJxBv4v2c4TnkqgB-8x6SnhkM?startTime=1585732803000">https://macquarie.zoom.us/rec/share/tJYuAZHV2E5JH6fs5nvAZoVxlb_LT6a80Xla-qcJxBv4v2c4TnkqgB-8x6SnhkM?startTime=1585732803000</a></p> </div> <div> <p><b>Session 3.2: The Normal Distribution - Determining Probability Under the Curve</b></p> <p><a href="https://macquarie.zoom.us/rec/share/5lstDZ7t9WhOetLx1IrEYf4jRYPKT6a8gCIWqfJmk5Q0Y7L5KHmnW_OqpASW6ew?startTime=1585783085000">https://macquarie.zoom.us/rec/share/5lstDZ7t9WhOetLx1IrEYf4jRYPKT6a8gCIWqfJmk5Q0Y7L5KHmnW_OqpASW6ew?startTime=1585783085000</a></p> </div> <div> <p><b>Session 3.3 The Normal Distribution-Some Applications</b></p> <p><a href="https://macquarie.zoom.us/rec/share/4uY2ELvdy1pIX5WT9wKPV4wbNlbaaaa80SVlrvILzE6f5toNtrRiXfDw7kCC8fc?startTime=1585800303000">https://macquarie.zoom.us/rec/share/4uY2ELvdy1pIX5WT9wKPV4wbNlbaaaa80SVlrvILzE6f5toNtrRiXfDw7kCC8fc?startTime=1585800303000</a></p> </div> <div> <p><b>Session 3.4 Inferential Statistics Estimation and Confidence Intervals</b></p> <p><a href="https://macquarie.zoom.us/rec/share/wMUylrip81hJX6vt427QYL8zOaP3aaa81Hcf_ZYyh0Uz9BpT4rsgYHlaidl3xV-?startTime=1585829925000">https://macquarie.zoom.us/rec/share/wMUylrip81hJX6vt427QYL8zOaP3aaa81Hcf_ZYyh0Uz9BpT4rsgYHlaidl3xV-?startTime=1585829925000</a></p> </div> <div> <p><b>Session 3.5 The Central Limit Theorem</b></p> <p><a href="https://macquarie.zoom.us/rec/share/tdVnEO7Xz19lepHJr2LVZa89Lp7eaaa8hChN-vpezhrllnVeizx2ryMRgu0b5Km?startTime=1585832371000">https://macquarie.zoom.us/rec/share/tdVnEO7Xz19lepHJr2LVZa89Lp7eaaa8hChN-vpezhrllnVeizx2ryMRgu0b5Km?startTime=1585832371000</a></p> </div> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>• Normal distribution - ch. 2.13</li> <li>• Areas under the normal curve - ch. 2.14 - ch. 2.18</li> <li>• Applications - ch. 2.19</li> <li>• Estimation - ch 3.1 - 3.3</li> <li>• Confidence intervals - ch 3.4 - 3.10</li> </ul>
Class Worksheets (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 3 Activity Normal Curve Calculations</li> <li>• Session 3.1 Activity Central Limit Calculations</li> </ul>

Tuesday 14 <sup>th</sup> July	6pm – 7:30 pm – Sydney time (via zoom)
Session 4	Regression and time series forecasting
Pre-work:	<p>Powerpoint Videos - (Links also in i-Learn)</p> <div> <p><b>Session 4.1 Regression Analysis - Correlation and Forecasting</b></p> <p><a href="https://macquarie.zoom.us/rec/share/z_xJD-vrz0ROcpXu5kr9e4EOOprXaaa81ylc_KUEzB6uWgL0otr03FiiOw1byv1v?startTime=1585890450000">https://macquarie.zoom.us/rec/share/z_xJD-vrz0ROcpXu5kr9e4EOOprXaaa81ylc_KUEzB6uWgL0otr03FiiOw1byv1v?startTime=1585890450000</a></p> </div> <div> <p><b>Session 4.2 Regression Basics</b></p> <p><a href="https://macquarie.zoom.us/rec/share/5e1RI7Ti90FJQp2U-HzFBKQAMNzXT6a80SIYrvINxRvaBZIC0m5ZfcbM_nmztc2N?startTime=1585903012000">https://macquarie.zoom.us/rec/share/5e1RI7Ti90FJQp2U-HzFBKQAMNzXT6a80SIYrvINxRvaBZIC0m5ZfcbM_nmztc2N?startTime=1585903012000</a></p> </div> <div> <p><b>Session 4.3: Regression Analysis Leverage Points Outliers and Residual Analysis</b></p> <p><a href="https://macquarie.zoom.us/rec/share/_d12DevqsWZIX5HnxE6GRqAvG6TJaaa81CUYr_YFnUhZ9tA1qy2Y7cQoB0E4lYoX?startTime=1585909846000">https://macquarie.zoom.us/rec/share/_d12DevqsWZIX5HnxE6GRqAvG6TJaaa81CUYr_YFnUhZ9tA1qy2Y7cQoB0E4lYoX?startTime=1585909846000</a></p> </div> <div> <p><b>Session 4.4 Regression Analysis Multiple Regression and Associated Issues</b></p> <p><a href="https://macquarie.zoom.us/rec/share/wfZ_JrXO9EBObbPg6k38AfMMQo3Geaa81nBMr6YFyk5PbeDPWsqSceIF60HUPTKZ?startTime=1586043174000">https://macquarie.zoom.us/rec/share/wfZ_JrXO9EBObbPg6k38AfMMQo3Geaa81nBMr6YFyk5PbeDPWsqSceIF60HUPTKZ?startTime=1586043174000</a></p> </div> <div> <p><b>Session 4.5 Regression Analysis Wine Aroma Example</b></p> <p><a href="https://macquarie.zoom.us/rec/share/xvB2KpDM2lpLcomW0mrhQYN6NLjgaaa823VI_PIEykwZ4JbMI-H7SmW3yPm07ohc?startTime=1586054007000">https://macquarie.zoom.us/rec/share/xvB2KpDM2lpLcomW0mrhQYN6NLjgaaa823VI_PIEykwZ4JbMI-H7SmW3yPm07ohc?startTime=1586054007000</a></p> </div> <div> <p><b>Session 4.6 Time Series Analysis</b></p> <p><a href="https://macquarie.zoom.us/rec/share/w5MpP6Pdxm5OWqPmxECOZe0CT5v5X6a82iVP8vUEXrYtTgqWS8a8M2O4RJ3q7TmV?startTime=1586059009000">https://macquarie.zoom.us/rec/share/w5MpP6Pdxm5OWqPmxECOZe0CT5v5X6a82iVP8vUEXrYtTgqWS8a8M2O4RJ3q7TmV?startTime=1586059009000</a></p> </div> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>• Correlation - ch 4.1 - 4.8</li> <li>• Regression models - ch 4.12 - 4.19</li> <li>• Exponential smoothing models - 4.23 - 4.28</li> <li>• Time series models - ch 4.9 - 4.11</li> <li>• Seasonal data - 4.29 - 4.30</li> <li>• Lag effects - 4.31 - 4.33</li> </ul>

Class Worksheets  (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 4 Linear Regression Analysis Handout</li> </ul>
<b>Tuesday 21<sup>st</sup> July</b>	<b>6pm – 7:30 pm – Sydney time (via zoom)</b>
<b>Session 5</b>	<b>Categorical Variables</b>
Pre-work:	<p><b>PowerPoint Videos</b></p> <p><b>Session 5.1 Analysis of Categorical Data Hypotheses Testing</b></p> <p><a href="https://macquarie.zoom.us/rec/share/uPBQAqHJ521OE4nMxUPkfr4jG77qaaa8gCcd-QPxBx-Fgp3WcPN7VCuoXc-RF7e?startTime=1586142493000">https://macquarie.zoom.us/rec/share/uPBQAqHJ521OE4nMxUPkfr4jG77qaaa8gCcd-QPxBx-Fgp3WcPN7VCuoXc-RF7e?startTime=1586142493000</a></p> <p><b>Session 5.2 Categorical Data Single Categorical Variables</b></p> <p><a href="https://macquarie.zoom.us/rec/share/2PJqLoyP1lFOf5Hn2lvNU74vJ4bkaa8gyYYqKlJnkz7AsrU9i-zrCWxGt-XSrnI?startTime=1586147815000">https://macquarie.zoom.us/rec/share/2PJqLoyP1lFOf5Hn2lvNU74vJ4bkaa8gyYYqKlJnkz7AsrU9i-zrCWxGt-XSrnI?startTime=1586147815000</a></p> <p><b>Session 5.3 Analysis of Categorical Data-Contingency Tables</b></p> <p><a href="https://macquarie.zoom.us/rec/share/yMVKCe_K32ZlBa_mr1DeXv4aN5rZX6a8gyUY_KVbn00vTkzd_j_FbgHNaZqPrgVY?startTime=1586165447000">https://macquarie.zoom.us/rec/share/yMVKCe_K32ZlBa_mr1DeXv4aN5rZX6a8gyUY_KVbn00vTkzd_j_FbgHNaZqPrgVY?startTime=1586165447000</a></p> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>• Introduction to hypothesis testing - ch 6.1 - 6.5</li> <li>• Categorical data - ch 5.1 - 5.3</li> <li>• Single variable data - ch 5.4 - 5.7</li> <li>• Contingency tables - 5.8 - 5.10</li> </ul>
Class Worksheets  (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 5 Analysis of Categorical Data 1</li> <li>• Session 5.1 Analysis of Categorical Data 2</li> </ul>

Tuesday 28 <sup>th</sup> July	6pm – 7:30 pm – Sydney time (via zoom)
Session 6	One Sample Testing
Pre-work:	<p><b>Powerpoint Videos</b></p> <p><b>Session 6.1 One Sample Tests z-Tests</b></p> <p><a href="https://macquarie.zoom.us/rec/share/9-FWFY_W629OW7ftuGvvY4dxR5r8T6a80CMY-PAEyBnmylEKt4EltYmnhOJnj462?startTime=1586170191000">https://macquarie.zoom.us/rec/share/9-FWFY_W629OW7ftuGvvY4dxR5r8T6a80CMY-PAEyBnmylEKt4EltYmnhOJnj462?startTime=1586170191000</a></p> <p><b>Session 6.2: One Sample Tests t-Tests p-value tests and confidence intervals</b></p> <p><a href="https://macquarie.zoom.us/rec/share/-OpkAr3r_GVOAbPvw2v9UPZxAd6-X6a823Ua-Ptcmk61Uw3xHAX9RF7mv4JZSagE?startTime=1586216259000">https://macquarie.zoom.us/rec/share/-OpkAr3r_GVOAbPvw2v9UPZxAd6-X6a823Ua-Ptcmk61Uw3xHAX9RF7mv4JZSagE?startTime=1586216259000</a></p> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>One-sample tests - ch 6.7 - 6.12</li> <li>Using Minitab - ch 6.13 - 6.16</li> </ul>
Class Worksheets (Optional Pre-work)	<ul style="list-style-type: none"> <li>Session 6 One Sample Testing</li> </ul>

## Block 2

Tuesday 4 <sup>th</sup> August	6pm – 7:30 pm – Sydney time (via zoom)
Session 7	Analysis of Variance ( ANOVA)

Pre-work:	<p><b>PowerPoint Videos</b></p> <p><b>Session 7.1 Analysis of Variance (ANOVA) Introduction and Single Variable Applications</b></p> <p><a href="https://macquarie.zoom.us/rec/share/7MoyP6Ggz35IRrPw6WaDAKwIOIX7eaa8hnQb_vcJyh70IsHaomPc5WyZlIMifaqL?startTime=1586477449000">https://macquarie.zoom.us/rec/share/7MoyP6Ggz35IRrPw6WaDAKwIOIX7eaa8hnQb_vcJyh70IsHaomPc5WyZlIMifaqL?startTime=1586477449000</a></p> <p><b>Session 7.2: Analysis of Variance (ANOVA) Multiple Comparisons</b></p> <p><a href="https://macquarie.zoom.us/rec/share/wNVTmpvUxEBIHqfRt2PzYL4tElvraaa8hyleqPYJzKxQrkOqfoEAYEbSeffSY9TH?startTime=1586485257000">https://macquarie.zoom.us/rec/share/wNVTmpvUxEBIHqfRt2PzYL4tElvraaa8hyleqPYJzKxQrkOqfoEAYEbSeffSY9TH?startTime=1586485257000</a></p> <p><b>Session 7.3 Analysis of Variance (ANOVA) Two Way ANOVA</b></p> <p><a href="https://macquarie.zoom.us/rec/share/3tRqP47f6mZJaa_U613-A_QYN6n7T6a8g3dlrKJemB0HVE5ZRuLAPe-fr2WPkoO-?startTime=1586490933000">https://macquarie.zoom.us/rec/share/3tRqP47f6mZJaa_U613-A_QYN6n7T6a8g3dlrKJemB0HVE5ZRuLAPe-fr2WPkoO-?startTime=1586490933000</a></p> <p><b>Session 7.4 Analysis of Variance (ANOVA) Two Way ANOVA With Replication</b></p> <p><a href="https://macquarie.zoom.us/rec/share/4_xlFZX0qGdLT53t92faUYwLFJrPeaa8g3dP-PcNnkyXwx08iwcCJqmUfqPkc6nR?startTime=1586503510000">https://macquarie.zoom.us/rec/share/4_xlFZX0qGdLT53t92faUYwLFJrPeaa8g3dP-PcNnkyXwx08iwcCJqmUfqPkc6nR?startTime=1586503510000</a></p> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>• Analysis of variance (one-way) - ch 8.1 - 8.7, 8.12</li> <li>• Multiple comparisons - ch 8.8 - 8.11</li> <li>• Analysis of variance (two-way) - ch 8.13 - 8.17</li> <li>• Using Minitab - ch 8.19</li> </ul>
Class Worksheets (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 7 One-way ANOVA Download Speeds</li> <li>• Session 7 One-way ANOVA Example Executive Salaries</li> <li>• Session 7 One-way ANOVA Example</li> <li>• Session 7 Two-way ANOVA Example</li> </ul>

Tuesday 11 <sup>th</sup> August	6pm – 7:30 pm – Sydney time (via zoom)
Session 8	Logistic Regression

Pre-work:	<p><b>Powerpoint Videos</b></p> <div> <p><b>Session 8.1 Logistic Regression Introduction and Odds</b></p> <p><a href="https://macquarie.zoom.us/rec/share/zPx3CLzlxFhLY8_A1BnidvA-E5rVX6a80CAc_PRZyU3S-pK5tD4gy0sxqelKjrsp?startTime=1586654501000">https://macquarie.zoom.us/rec/share/zPx3CLzlxFhLY8_A1BnidvA-E5rVX6a80CAc_PRZyU3S-pK5tD4gy0sxqelKjrsp?startTime=1586654501000</a></p> </div> <div> <p><b>Session 8.2 Logistic Regression – Simple Logistic Regression</b></p> <p><a href="https://macquarie.zoom.us/rec/share/-_1yIJzryFNJW5Xu6BniBekLGY_Heaa81SJKrvoOnh44CaE0rE060ARm0fjeL86j?startTime=1586660193000">https://macquarie.zoom.us/rec/share/-_1yIJzryFNJW5Xu6BniBekLGY_Heaa81SJKrvoOnh44CaE0rE060ARm0fjeL86j?startTime=1586660193000</a></p> </div> <div> <p><b>Session 8.2.1 Simple Logistic Regression NASA Case Study</b></p> <p><a href="https://macquarie.zoom.us/rec/share/pu9MNZXP811Ja5GXs2D6Sq88XaPLX6a81ygXrqcJy0zn98jcH3rs7huW4LkQNFzI?startTime=1586667900000">https://macquarie.zoom.us/rec/share/pu9MNZXP811Ja5GXs2D6Sq88XaPLX6a81ygXrqcJy0zn98jcH3rs7huW4LkQNFzI?startTime=1586667900000</a></p> </div> <div> <p><b>Session 8.3 Logistic Regression - Multiple Logistic Regression</b></p> <p><a href="https://macquarie.zoom.us/rec/share/wNQsK-qtzFILbNaTr336VooRWZX5eaa8hicYq6EEzBzeYOQHr288Y-zZf5gdfh2x?startTime=1586673909000">https://macquarie.zoom.us/rec/share/wNQsK-qtzFILbNaTr336VooRWZX5eaa8hicYq6EEzBzeYOQHr288Y-zZf5gdfh2x?startTime=1586673909000</a></p> </div> <p><b>Text book Readings</b></p> <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 covariates - ch 9.13</li> </ul>
Class Worksheets (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 8 Log Regression Worksheet 1</li> <li>• Session 8 Log Regression Worksheet</li> </ul>
Tuesday 18 <sup>th</sup> August	6pm – 7:30 pm – Sydney time (via zoom)

Session 9	Queue Theory
Pre-work:	<p><b>Powerpoint Videos</b></p> <p><b>Session 9.1 Queues Introduction and Single line single server (MM1) Queues</b></p> <p><a href="https://macquarie.zoom.us/rec/share/y5JeA-r0piBIE6vE63_tA6kmM9j-aaa8hyQZr_QlyEzg1iIPCWtWwk1lcnMtBpJV?startTime=1586733718000">https://macquarie.zoom.us/rec/share/y5JeA-r0piBIE6vE63_tA6kmM9j-aaa8hyQZr_QlyEzg1iIPCWtWwk1lcnMtBpJV?startTime=1586733718000</a></p> <p><b>Session 9.2 Queues-Introduction to Simulation</b></p> <p><a href="https://macquarie.zoom.us/rec/share/585aH6nWqEFJXLP8sAbCYZQuB5y4aaa80XJM-vEEnkibKr3GwMpSo3bRbVkgcdXM?startTime=1586742908000">https://macquarie.zoom.us/rec/share/585aH6nWqEFJXLP8sAbCYZQuB5y4aaa80XJM-vEEnkibKr3GwMpSo3bRbVkgcdXM?startTime=1586742908000</a></p> <p><b>Session 9.3 Queues Single Line Multiple Server (MMs) Queue Systems</b></p> <p><a href="https://macquarie.zoom.us/rec/share/64ssK5fTyntLbrPBt1CHYr8sQ4G5aaa8hHMeq_MJzh2ZJhxE-6ieYpK0V2mG0T5O?startTime=1586748611000">https://macquarie.zoom.us/rec/share/64ssK5fTyntLbrPBt1CHYr8sQ4G5aaa8hHMeq_MJzh2ZJhxE-6ieYpK0V2mG0T5O?startTime=1586748611000</a></p> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>• Queueing systems - ch 12.1</li> <li>• Definitions and parameters - ch 12.2 - 12.9</li> <li>• A simple queue - ch 12.10</li> <li>• Calculation of probabilities and outcomes - ch 12.11, 12.13 - 12.14</li> <li>• Multiple server queues - 12.16 - 12.22</li> </ul>
Class Worksheets  (Optional Pre-work)	<ul style="list-style-type: none"> <li>• Session 9 Activity 1 MGSM Phones Worksheet</li> <li>• Session 9 Activity 2 Fast Food Restaurant Worksheet</li> <li>• Session 9 Activity 3 Six Sigma Bank</li> <li>• Session 9 Activity 4 Telephone Ordering System</li> </ul>

Tuesday 25 <sup>th</sup> August	6pm – 7:30 pm – Sydney time (via zoom)
Session 10	Course Review, Assignment and Exam Q&A

Pre-work:	<p><b>PowerPoint Videos</b></p> <p><b>Session 10.1 Review-Introduction , Normal Curve and Estimation</b></p> <p><a href="https://macquarie.zoom.us/rec/share/x51ZEptI7GJJQJXntHnPBbQZN4fDeaa81ihL-PZYz0oLKPnTqgLAfXFgdJN16Bgx?startTime=1587430334000">https://macquarie.zoom.us/rec/share/x51ZEptI7GJJQJXntHnPBbQZN4fDeaa81ihL-PZYz0oLKPnTqgLAfXFgdJN16Bgx?startTime=1587430334000</a></p> <p><b>Session 10.2 Review Discrete Random Variables Expected Values Decision Trees and Categorical Data</b></p> <p><a href="https://macquarie.zoom.us/rec/share/vsV3LrCr8W5lRYHu6GHWeKglR5-7eaa81yIY8qlJyUsp_L-o8FuwhLwhF04waiq7">https://macquarie.zoom.us/rec/share/vsV3LrCr8W5lRYHu6GHWeKglR5-7eaa81yIY8qlJyUsp_L-o8FuwhLwhF04waiq7</a></p> <p><b>Session 10.3 Review ANOVA Linear and Logistic Regression and Queueing</b></p> <p><a href="https://macquarie.zoom.us/rec/share/1dYscrOq92xOZbfBt2DBVo0nEaC8X6a8hnVM_fRbyU3tg1p-sn32tcltAepHY8To">https://macquarie.zoom.us/rec/share/1dYscrOq92xOZbfBt2DBVo0nEaC8X6a8hnVM_fRbyU3tg1p-sn32tcltAepHY8To</a></p> <p><b>Text book Readings</b></p> <ul style="list-style-type: none"> <li>Review all previous readings</li> </ul>
Class Worksheets  (Optional Pre-work)	<ul style="list-style-type: none"> <li>Session 10 Revision Activity 1 Normal Curve</li> <li>Session 10 Revision Activity 2 Estimation and Confidence Intervals Exercise</li> <li>Session 10 Revision Activity 3 Expected Value Calculations</li> <li>Session 10 Revision Activity 4 Analysis of Categorical Data</li> <li>Session 10 Revision Activity 4.3 One Sample Tests</li> <li>Session 10 Revision Activity 5 Linear Regression Analysis New TV Handout</li> <li>Session 10 Revision Activity 5 Single ANOVA</li> <li>Session 10 Revision Activity 6 Log Regression</li> <li>Session 10 Revision Activity 7 Queueing</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.*)

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 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](https://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.