This unit introduces data analysis and decision-making tools that students are able to use to manage their own day-to-day work. Students are able to identify situations in which quantitative analysis can support problem solving and decision-making. They also gain practical experience in applying statistical and decision analysis techniques and statistical packages (generally Excel) in management contexts. Topics covered include introduction to modelling of organisations and business problems; measurement; variability; uncertainty; statistical tests and quantitative approaches to decision making. The unit provides a foundation for quantitative techniques used in other Master of Business Administration units.
Contact details

Ms Catherine Jordan’s

<table>
<thead>
<tr>
<th>Email:</th>
<th><a href="mailto:cjordan@gsm.uwa.edu.au">cjordan@gsm.uwa.edu.au</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone:</td>
<td>+ 618 6488 7987</td>
</tr>
<tr>
<td>Fax:</td>
<td>+ 618 6488 1072</td>
</tr>
</tbody>
</table>

Lecture Times:

**Stream 1:**
- 2 July 9.00am-6.00pm
- 4 July 6.00pm-10.00pm
- 11 Aug 6.00pm-10.00pm
- 13 Aug 9.00am-6.00pm

**Stream 2:**
- 3 July 9.00am-6.00pm
- 5 July 6.00pm-10.00pm
- 12 August 6.00pm – 10.00pm
- 14 August 9.00am – 6.00pm

Tutor: Dr. Corwyn Low Eng Kong

Tutorial Times:

**Stream 1:**
- 13 July, 27 July, 24 Aug, 7 Sept
  7.00pm-10.00pm

**Stream 2:**
- 11 July, 20 July, 17 Aug, 31 Aug
  7.00pm-10.00pm

Your lecturer

BPsych (UWA), MPych (w distinction) (Curtin), PhD Candidate (UWA)

**Catherine Jordan** holds a Bachelor of Psychology degree from UWA and a Masters degree in Psychology (with distinction) from Curtin University. She has been a lecturer at the Graduate School of Management at UWA since August 1999. During this time she has taught the ‘Data Analysis and Decision Making’ unit on the Graduate Diploma in Business Administration and MBA programs both in Perth and Singapore. She is also the Program Director for the Australian National Business School Programs offered at UWA. Previous to this, Catherine worked at the Graduate School of Business at Curtin University teaching the ‘Information for Business Decisions’ unit. Catherine also does consulting work for several organisations including Alcoa, Centrelink, Western Power, Health Department WA, Main Roads, Silver Chain, City of Perth and St John of God Health Care. Much of this work involves the collection and analysis of data in order to develop strategies for improved organisational effectiveness. Catherine’s research interests include organisational citizenship behaviour, customer satisfaction, services marketing and emotional labour. She is currently working on her PhD which is entitled “Emotional Labour in the Workplace: Understanding its relationship with employee attitudes, performance and service quality”.
Introduction

I would like to warmly welcome you to Data Analysis and Decision Making in term V, 2005. I hope you are enthusiastic about taking this unit, and I trust that you find it enjoyable and applicable to your work. I expect that many of you are feeling very nervous; especially if this is the first time you have studied statistics. However, I would like to reassure you that this is quite normal. I hope that as we work through the topics together you will start to feel more comfortable, and even may start to enjoy undertaking this unit. In my experience, learning about statistics is similar to learning a new language or skill; initially you will be confused, then frustrated, and finally (with hard work and perseverance) you will understand how to use and apply the statistical tools and techniques discussed in class (and hopefully before sitting the final exam). Therefore, you need to continuously read your textbook and work through several exercises so that you quickly reach the point where everything starts to make sense.

I cannot stress enough how important it is to continuously study for this unit throughout the semester, as many of the topics covered in this unit are cumulative. To help you with this I have included an in-class quiz that will encourage you to keep up with the workload and will help you prepare for the exam (and hopefully reduce some exam anxiety). You also need to complete a ‘Statistics in Practice’ project, which requires you to identify an issue in an organisation, collect and analyse relevant data, then provide appropriate recommendations. There is also a class participation mark and an open-book exam.

Most of the information presented in this unit will be in lecture format, with me doing the talking, however please feel free to stop me if there is anything you don’t understand. Remember, you are unlikely to be the only person experiencing difficulty with a particular concept, so please speak up if in doubt. Much of the material is conceptual but, unlike other fields of mathematics, statistics lends itself to discussion and interpretation. My interpretation of a particular scenario is only one of a range of opinions, so don’t hesitate to stop me if there is something you would like to discuss further.

One last piece of advice: It is important to approach this unit with a positive attitude. Many students, when they start this unit, make comments such as ‘I am not a numbers person’, ‘At school I was never good at maths so how am I going to survive this unit’ or ‘there is no way I will pass stats’. Unfortunately this often becomes a self-fulfilling prophecy. As a student who has survived many years of statistics at university-level I strongly believe that a positive attitude is vital for success with statistics.

REMEMBER if you think you can’t- then YOU CAN’T, BUT if you think you can- YOU CAN!

Lastly, I would like to wish you all the very best with your studies in this unit. Please note that at any time you feel overwhelmed all you need to do is contact me so that we can work through your concerns together, the earlier the better.

The goal of the unit

Any manager operating in a business environment requires as much information as possible about the characteristics of that environment. Much of the available information is quantitative, for example, movements in interest rates, stock market price, money supply and the level of unemployment. Market research surveys are carried out to determine the strength of product demand. An auditor is concerned about the number and size of errors found in account receivables. A human resource manager may be able to use aptitude test scores, in addition to subjective evaluation of candidates, for the recruitment of personnel. Even in sport, statistics is increasingly used as an objective means to assess the signing of players and also to evaluate the strengths and weaknesses of opponents. If you think about it we confront statistics in most of our everyday life.

The common features of the above examples are that the information to be absorbed is numerical or categorical and, in its raw form, virtually impossible to comprehend fully. One of the important roles of today’s manager is to make sense of quantitative data by summarising it in such a way that a readily understood picture emerges.

This unit introduces data analysis and decision-making tools to help students manage their own day-to-day work. It must be emphasized that this unit is not designed to convert you into a statistician (which I am sure is a relief) but rather to give you an appreciation of the various uses of data that are readily available or easily obtainable.
This unit does not focus on ‘number crunching’ but rather on the analysis and interpretation of computer-generated results for meaningful decision-making. It also provides a statistical foundation for quantitative techniques used in other MBA units, including Economics, Finance, Marketing, and Quality Management.

Please rest assured that the objective of this unit is not to turn you into a statistician. The focus of this unit is on the interpretation of results rather than on the ‘number crunching’ to get the results. However, please note that if at any time you are finding the unit overwhelming please contact me so that we can work through your concerns together.

Broad learning outcomes

On successful completion of this unit, students should have an understanding of:

1. data available to aid decision-making within the workplace;
2. the statistical packages and add-ins available for analysing business data;
3. the application of statistical techniques and skills to practical business decision-making;
4. methods to critically appraise the accuracy, sources, and relevance of statistical data and models; and
5. how to critically appraise reports and arguments based on such data and models.

Prerequisites

This is a foundation unit which provides a basic understanding of the principles of data analysis for business decision-making and therefore has no prerequisites.

Software requirements

A prior knowledge of Excel is desirable but not essential. The CD-ROM accompanying the textbook has an Excel Primer section (pg 10-48) along with the PHStat2 add-in. Additionally, the textbook provides detailed instructions for using MS Excel with an Excel Handbook section at the end of most topics. Both Excel and PHStat2 will be used in the lecture notes and students will be expected to interpret results from these packages for the in-class quiz and final exam. Additionally, students will need to use the packages to summarise data in the ‘Statistics in Practice’ project.

As previously stated the emphasis throughout this unit is on the interpretation of results, rather than the mechanical application of formulae, therefore the use of statistical packages such as MS Excel (with the PHstat2 add-in) provide a user-friendly way to analyzing the data. On the disc provided with your text you will find PHStat2 which is an add-in to EXCEL. This add-in provides an additional drop-down menu from your tool bar. This will help simplify many computations however there are still some calculations where you will need to revert back to the EXCEL menu. Please install this onto your computer before the first class.

Calculator requirements

As MS Excel will be used for most computations you do not need to purchase an expensive calculator. A basic scientific calculator that has the square root, memory and power functions should be adequate.

ANBS Support Materials CD

A CD has been included with your course materials. The Australian National Business School (ANBS) Ltd has developed this CD to support your studies and is making it available only to students at ANBS affiliated universities (of which UWA is included). ANBS believes that these materials will enrich your learning experience, provide you with a practical and easy-to-use resource and enable you to access the accumulated insights of discipline experts across the ANBS consortium.
This CD contains materials relevant to eight MBA core units offered in the programs of ANBS consortium members. Resources for each unit were assembled by a Unit Team, including a subject specialist from your university, and one from each of the other five consortium members. As such, this CD represents the collective insights of six subject specialists in each of these eight discipline areas. Clearly if such a team has selected these materials, they should be of great interest to you.

This resource will be of use to you in two major ways. First, your lecturer may choose resources from this CD to supplement your learning experience. In that sense, this CD is a portable library. Second, you may choose to use the CD as a personal resource database when preparing your assignments or preparing for exams. The CD provides you with a powerful search facility that allows you to type in key words and phrases and find matching resources.

I trust you find this CD of great value to you in your MBA studies. I welcome your feedback.

Textbooks

Recommended/required text


Additional/Suggested/Alternate text(s)

Refer to the Study Guide on the ANBS CD-rom for additional readings relating to each topic.
### Seminar topics

<table>
<thead>
<tr>
<th>Seminar/Date</th>
<th>Topics</th>
<th>Text Readings</th>
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</thead>
<tbody>
<tr>
<td><strong>Stream 1:</strong> 2 July 9am-6.00pm</td>
<td><strong>Module 1: Course Introduction</strong>  &lt;br&gt;&lt;strong&gt;Topic 1: Introduction to Business Statistics&lt;/strong&gt;  &lt;br&gt;This topic provides an introduction to the area of business statistics. Specific focus is given to the relevance of statistical tools and techniques for managers. The different types of data (categorical, numerical, discrete, continuous), data collection and data sampling methods are also discussed.</td>
<td>Ch 1 (all sections)</td>
</tr>
<tr>
<td><strong>Stream 2:</strong> 3 July 9.00am-6.00pm</td>
<td><strong>Topic 2: Presenting Data</strong>  &lt;br&gt;This topic focuses on the visual presentation of both categorical and numerical data. Charts and tables appropriate for displaying the different types of data are discussed. Common errors in presenting data are also addressed.</td>
<td>Ch 2 (Sections 2.1, 2.2, 2.4, 2.6)</td>
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<tr>
<td></td>
<td><strong>Topic 3: Describing Data</strong>  &lt;br&gt;This topic addresses the different ways to summarise numerical data in terms of measures of central tendency, dispersion and shape. Appropriate use of each summary measures is also discussed.</td>
<td>Ch 3 (all sections)</td>
</tr>
<tr>
<td><strong>Stream 1:</strong> 4 July 6.00pm-10.00pm</td>
<td><strong>Module 2: Dealing with Risk and Uncertainty</strong>  &lt;br&gt;&lt;strong&gt;Topic 4: Probability and Distributions&lt;/strong&gt;  &lt;br&gt;This topic provides a good foundation for future topics. Properties of the normal distribution and sampling distribution are discussed and the calculation of z and t scores is also introduced.</td>
<td>Ch 4 (Section 4.1)  Ch 6 (Sections 6.1, 6.2, 6.5, 6.6)</td>
</tr>
<tr>
<td><strong>Stream 2:</strong> 5 July 6.00pm-10.00pm</td>
<td><strong>Topic 5: Interval Estimates</strong>  &lt;br&gt;This topic provides an alternative to point estimates by introducing confidence intervals. These intervals are often considered more useful than point estimates, which are either right or wrong with no assignable confidence level.</td>
<td>Ch 7 (Sections 7.1, 7.2, 7.6)</td>
</tr>
<tr>
<td><strong>Tutorial 1</strong>  Stream 1: 13 July</td>
<td><strong>Module 1</strong>  &lt;br&gt;- Topic 1: Introduction to Business Statistics  &lt;br&gt;- Topic 2: Presenting Data  &lt;br&gt;- Topic 3: Describing Data</td>
<td>Textbook  Exercises</td>
</tr>
<tr>
<td><strong>Tutorial 2</strong>  Stream 1: 27 July</td>
<td><strong>Module 2</strong>  &lt;br&gt;- Topic 4: Probability and Distributions  &lt;br&gt;- Topic 5: Interval Estimates</td>
<td>Textbook  Exercises</td>
</tr>
<tr>
<td><strong>Stream 2:</strong> 20 July</td>
<td><strong>Tutorial 2</strong>  Stream 1: 27 July</td>
<td><strong>Module 2</strong>  &lt;br&gt;- Topic 4: Probability and Distributions  &lt;br&gt;- Topic 5: Interval Estimates</td>
</tr>
<tr>
<td>Seminar/Date</td>
<td>Topics</td>
<td>Text Readings</td>
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| **Stream 1:** 11 Aug 6.00pm-10.00pm | **In-class Quiz (Modules 1 & 2)**  
**Module 3: Comparing Group Differences**  
**Topic 5: Introduction to Hypothesis Testing**  
It is often useful to determine whether a difference is real (i.e. statistically significant) or simply due to chance. Hypothesis testing is introduced in this topic where assumption testing, calculation and interpretation of one-sample t/z tests are discussed. | Ch 8 (Section 8.1-8.4, 8.6) |
| **Stream 2:** 12 August 6.00pm – 10.00pm | **Topic 6: Comparing Group Differences**  
Building on from topic 6 this topic extends hypothesis testing to allow comparisons between groups. Group differences for both independent and dependent two sample z/t tests are discussed. | Ch 9 (Section 9.1, 9.2, 9.4) |
| **Stream 1:** 13 Aug 9.00am-6.00pm | **Module 4: Prediction and Forecasting**  
**Topic 7: Introduction to Prediction**  
This topic introduces correlation as a method for understanding the strength and direction of the relationship between two variables. Building from correlation, the basics of simple linear regression for prediction within the data range are then addressed. | Ch 12 (Sections 12.1-12.5, 12.7, 12.9) |
| **Stream 2:** 14 August 9.00am – 6.00pm | **Topic 8: Predicting Values Using Multiple Independent Variables**  
This topic of multiple regression analysis extends the previous topic of simple linear regression to include the use of multiple independent variables for model development. | Ch 13 (Sections 13.1-13.4, 13.6)  
Ch 14 (Sections 14.3-14.5) |
| **Topic 9: Forecasting Values**  
This topic focuses on the use of time series data (data collected at regular time intervals: months, quarters, years) to forecast future data values with statistical techniques such as moving averages, exponential smoothing and regression analysis. | Ch 15 (Sections 15.1-15.4, 15.6, 15.7, 15.9) |
| **Tutorial 3**  
**Stream 1:** 24 Aug  
**Stream 2:** 17 Aug | **Module 3**  
- **Topic 5: Introduction to Hypothesis Testing**  
- **Topic 6: Comparing Group Differences** | |
| **Tutorial 4**  
**Stream 1:** 7 Sept  
**Stream 2:** 31 Aug | **Module 4**  
- **Topic 7: Introduction to Prediction**  
- **Topic 8: Predicting Values Using Multiple Independent Variables**  
- **Topic 9: Forecasting Values** | |
| **Exam** | Thursday 15th September 2005  
2.00pm – 4.10pm | |
Attendance

Participation in class, whether it be listening to a lecture or getting involved in other activities, is an important part of the learning process. For this reason the GSM has decided not to move to on-line teaching. It is, therefore, important that you attend classes (and be on time).

More formally, the University regulations state that ‘to complete a course or unit a students shall attend prescribed classes, lectures, seminar and tutorials’. Students whose attendance at MBA units has been unsatisfactory will not be granted a pass grade.

Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Conditions</th>
<th>Due Date</th>
</tr>
</thead>
</table>
| In-class Quiz (Modules 1&2)        | 20%    | This in-class quiz is closed-book with a 45-minute completion time (plus 5 mins reading time) | **Stream 1**: 11 Aug 6.15pm *sharp*  
**Stream 2**: 12 Aug 6.15pm *sharp* |
| Class Participation                | 10%    | ongoing                                                                     |                                 |
| ‘Statistics in Practice’ Project   | 30%    | Maximum 1800 words. Prepared for senior management with little or no statistical exposure. | During your last tutorial class  
**Stream 1**: Sept 7  
**Stream 2**: Aug 31 |
| Final Exam (2 hours)               | 40%    | Open book, covering ALL lectures.                                           | Thursday 15th September 2005 2.00pm – 5.00pm |

TOTAL MARKS 100%

The Purpose of Assessment

There are a number of reasons for having assessable tasks as part of an academic program. The assessable tasks are designed to encourage you to explore and understand the subject more fully. The fact that we grade your work then gives you an indication of how much you have achieved. Providing feedback on your work also serves as part of the learning process.
Assessment 1: In-class Quiz

OBJECTIVE

The purpose of the in-class quiz is to help you keep up with the workload in this unit. This is vital as most topics are cumulative and thus if you don’t understand foundation topics it is unlikely that you will understand future topics that build on these foundations. The quiz is designed to provide you with helpful feedback on your progress. A practice quiz will be distributed to help with your study.

The quiz will be of 45-minutes duration (plus 5 minutes reading time) and will consist of a combination of multiple-choice and short-answer questions. The quiz will be closed-book with only calculators and statistical tables available for assistance. The quiz is worth 20% towards your final mark.

Assessment 2: Class Participation

A class participation mark of 10% will apply to this unit. This will relate to your participation during lectures and tutorial classes. This grade will be jointly allocated by your tutor and lecturer. The following table provides an indication of the grades assigned to different levels of participation.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Criteria</th>
</tr>
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</table>
| 1 – 4 | Present, not disruptive  
• Tries to respond when called on but offers very little.  
• Demonstrates very infrequent involvement in discussion. |
| 5 – 6 | Demonstrates adequate preparation  
• Knows basic material, case or reading facts, but does not show evidence of trying to interpret or analyse them.  
• Offers straightforward information (e.g., straight from the text, case or reading), without elaboration or very infrequently (perhaps once a class).  
• Does not offer to contribute to discussion, but contributes to a moderate degree when called upon.  
• Demonstrates sporadic involvement. |
| 7 - 8 | Demonstrates good preparation  
• Knows text, case or reading facts well, has thought through implications.  
• Offers interpretations and analysis of issues (more than just facts) to class.  
• Contributes well to discussion in an ongoing way - responds to other students' points, thinks through own points, questions others in a constructive way, offers and supports suggestions that may be counter to the majority opinion.  
• Demonstrates consistent ongoing involvement. |
| 9 - 10 | Demonstrates excellent preparation  
• Has analysed topic concepts and issues exceptionally well, relating them to other material (e.g., readings, course handouts, discussions, experiences, etc.).  
• Offers analysis, synthesis, and evaluation of issues discussed, e.g., connects discussion to develop new approaches that take the class further.  
• Contributes in a very significant way to ongoing discussion: keeps analysis focused, responds very thoughtfully to other students' comments, contributes to the cooperative argument-building, suggests alternative ways of approaching material and helps class analyse which approaches are appropriate, etc.  
• Demonstrates ongoing very active involvement. |

PLEASE note that simply asking a question in class does not constitute a ‘class contribution’. While there is an expected level of contribution to the class and group discussions, the quantity of talking is less important in the above criteria than the quality of your contribution.
Assessment 3: ‘Statistics in Practice’ Project

OBJECTIVES

The ‘Statistics in Practice’ project is designed to develop your skills in the correct usage of statistical techniques and interpretation of data for making managerial decisions. This project can be completed individually or in pairs. The main task is to analyse existing data and prepare a report for management based on the analysis. The purposes of the project include:

- Showing how summary statistics and summary charts can be used to present sample data succinctly;

AND EITHER:

- Identifying the most efficient combination of explanatory variables to predict the response variable for cross-sectional data (using a minimum of 5 predictor variables)

OR

- To apply time-series techniques to predict the response variable for longitudinal data.

The ‘Statistics in Practice’ Project is worth 30% of your final mark and must be handed in during your last tutorial session (Stream 1: 7 Sept, Stream 2: Aug 31). Case-specific examples will be distributed to students for guidance.

DATA FOR YOUR “STATISTICS IN PRACTICE” PROJECT

Please note that if you are going to use data from your workplace please check with me first so that I can let you know whether the data is suited to your particular project.

If you are unable to obtain data from your workplace for the project there are three specialist databases that may be helpful. These are available through the UWA Business Library. Please feel free to contact the Business Library for help on accessing and extracting data from these databases. The databases are:

Global Market Information Database, a service produced by Euromonitor which provides a range of information designed for marketing and doing business internationally.

Austats, a service produced by the ABS that provides electronic access to the Bureau’s major statistical publications.

CDATA96, also produced by the ABS, provides a range of demographic and social statistics collected from the 1996 census.

Additionally, you may want to access government-collected data specific to Singapore. The following web site may help. [www.SingStat.gov.sg](http://www.SingStat.gov.sg)
STRUCTURE

The report should include the following sections, with marks (for a total of 100) shown. Do not try and cover too many aspects of a particular topic.

<table>
<thead>
<tr>
<th>Section</th>
<th>Task</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Includes your name, the title of the report and its word length.</td>
<td>05</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>A single paragraph should describe the most important facts and conclusions from the report. This section is often easier to write last. Please note this is not an introduction to your report but a snapshot summary.</td>
<td>10</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>Gives an outline of the report together with page numbers.</td>
<td>05</td>
</tr>
<tr>
<td>Introductions</td>
<td>Several paragraphs in which you describe the background, the question(s) of interest and the relevant dataset(s). The key variables should be outlined and relevant assumptions discussed. Data collection methods should also be discussed.</td>
<td>15</td>
</tr>
<tr>
<td>Analysis and Methods</td>
<td>Interpret the data with the aid of graphical displays and statistical summaries. As the report is to be prepared for senior management with little or no exposure to statistical tools and techniques, the interpretations should be explained in clear, concise terms. It is not necessary to show complex formulae, nor is it necessary to show in-depth computations.</td>
<td>45</td>
</tr>
<tr>
<td>Conclusions and Summary</td>
<td>Summarises the detail presented in the previous section and discusses possible recommendations.</td>
<td>20</td>
</tr>
<tr>
<td>References</td>
<td>Harvard Style or Endnote (see pg. 14 of this unit outline).</td>
<td>0</td>
</tr>
<tr>
<td>Appendices</td>
<td>Should include all tables and graphs not directly referred to in the report. All tables and graphs should have a number and a title.</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>The report is worth 30% of your final mark and should be a maximum of 1800 words (excluding table of contents, charts and tables, and appendices).</td>
<td>100</td>
</tr>
</tbody>
</table>

Submission of assignments

Assignments should be submitted on or before the due date. Assignments should be submitted through the PSB office. A cover sheet must be used and is included with this unit outline (page 17). Late assignments will attract a penalty of 5% per day. This penalty will be waived by the lecturer only in exceptional circumstances. No marks will be awarded to assignments submitted after other students in the class have had their assignments returned. It is the intention that the marked assignments will be returned within three weeks of submission.

Assessment 4: Final Exam

The final exam, to cover ALL lecture material, will be held on Thursday 15th September 2005 from 2.00pm - 4.10pm. The exam will be two hours plus 10 minutes reading time and will be a combination of multiple-choice and short-answer case-study questions. It will be open-book and is worth 40% of your final mark.
The standard of assessment

The Graduate School must ensure that the processes of assessment are fair and are designed to maintain the standards of the School and its students. The School follows the University of Western Australia’s grading system:

- **HD (Higher Distinction)**: 80-100%
- **D (Distinction)**: 70-79%
- **CR (Credit Pass)**: 60-69%
- **P (Pass)**: 50-59%
- **N+ (Fail)**: 45-49%
- **N (Fail)**: 0-44%

The School awards marks leading to these grades by using the following general criteria which are presented here as an indication of the School’s expectations. These general criteria may be supplemented by specific standards provided with regard to a particular assignment.

**HD** The student has a clear understanding of theory, concepts and issues relating to the subject and is able to adopt a critical perspective. The student is able to clearly identify the most critical aspects of the task and is able to offer a logically consistent and well articulated analysis within the analytic framework presented in the course. The student is able to draw widely from the academic literature and elsewhere but maintains relevance.

**D** The student has a clear understanding of theory, concepts and issues relating to the subject. The student is able to develop an analysis of an issue using the analytic framework presented in the course and is able to identify and evaluate the critical issues. The student is able to draw upon relevant academic and other material.

**CR** The student demonstrates an understanding of the analytic framework developed in the course and a partial understanding of concepts and issues. The student is able to identify some key issues and is able to present a logical discussion, but with some conceptual errors or gaps between analysis and conclusions, shortcoming. The student is able to draw upon an adequate range of references and other materials.

**P** The student generally takes a descriptive rather than analytic approach to the subject. The student is able to demonstrate some understanding of the issues involved but does demonstrate the ability to apply the analytical framework which had been developed in the course. Draws primarily upon course materials for referencing.

**N+** The student is unable to demonstrate that he or she understands the core elements of the subject matter. The student is able to provide some insight into issues but misapplies analytic framework developed in course, omitting key factors and, for example, drawing conclusions which are not related to the preceding discussion.

**N** The student is unable to demonstrate any understanding of the subject matter. Material presented for assessment is unrelated to course framework and shows no effort to identify or address critical aspects of the topic.

The scaling of marks to ensure comparability between classes in an acceptable academic practice. The GSM and Board of Examiners has the right to scale marks where it is considered necessary to maintain consistency and fairness.
Appeals against assessment marks

In the first instance, students are strongly advised to talk informally to the lecturer about the grade awarded.

The University provides the opportunity for students to lodge an appeal against any mark which he or she feels is unfair. Any student making an appeal is under an obligation to establish a prima facie case by providing particular and substantial reasons for the appeal.

There is a 10 day time limit for making any such appeal. An appeal against academic assessment may result, as appropriate, in an increase or decrease in the mark originally awarded. The University regulations relating to appeals and the form on which the appeal should be lodged can be found in the GSM website.

Acknowledgements and plagiarism

In the course of your individual and group work assignments, you will encounter ideas from many sources. These will include journal and newspaper articles, commentaries, books, web sites and other electronic sources, original case sources, lecture materials. All assignments that you submit must acknowledge all the different sources you have used.

Not to acknowledge your sources is plagiarism, a form of dishonesty. Plagiarism is the misappropriation of the work or ideas of others and presenting them as your own. This is reprehensible from both an ethical and legal viewpoint. Neither the School nor the University accepts ignorance or the fact that a student’s previous acts of plagiarism had been undetected as a defence.

In order to avoid engaging in plagiarism it is your responsibility to acknowledge all of your sources in any work submitted for assessment and it is essential that you reference the work of others correctly. Where you quote directly from a source, you must ensure that any direct quotations are placed in quotation marks and are fully referenced. Even when you do not quote directly and are just referring to or expanding on the work of others, you must still acknowledge the sources of your information and ideas. Close paraphrasing in which you change a few phrases around, leave a clause out of a long sentence or put the original sentences in a different order is still plagiarism.

Advice on proper referencing is given below. If you have any doubts concerning appropriate referencing formats or how to acknowledge the work of others correctly, you should seek the advise of your lecturer.

It is GSM policy that no student will profit from plagiarism. Generally, a mark of ‘Fail’ will be recorded for the assignment in which this has occurred, regardless of its other merits or qualities. Serious cases shall be referred to the University’s Board of Discipline. All students should note that cases of copying are automatically reported to the Sub-Dean and documentary evidence along with associated correspondence is placed on the student’s permanent record.

Taping of Lectures

The Graduate School does not provide tape recordings of lectures, however if you do wish to tape record a lecture then as a matter of courtesy, you should obtain the permission of the lecturer first.
Referencing

It is important that the referencing of any sources used in your written work is done properly, if only to substantiate the points you are making in your assignment or project. The Harvard style is the preferred and there are some notes for guidance which have been prepared by the library staff: ‘Citing your sources Harvard Style’

Endnote is a really good system for building up a database of references. Not everyone will want to invest the time in using this system but you should consider it if you intend to build up resource materials or plan to undertake extensive research in a particular area. The library staff have also developed a tutoring package: ‘A quick Guide to Using EndNote’ which provides the basics for using EndNote with an essay

This is a link from the ‘How to Use EndNote’ page www.library.uwa.edu.au/guides/endnote/ which provides more comprehensive information.

Additional resources and reading material

Refer to the Study Guide included on the ANBS CD-rom for additional readings and web site links related to each topic.

Learning the Statistics Lingo

Often students first taking a statistics course feel that the experience is similar to learning a foreign language (or pulling teeth). Therefore, the following web sites each have an extensive glossary of statistical terms that will help you become familiar with this new language.

http://www.statsoft.com/textbook/glosfra.html
http://www.stats.gla.ac.uk/steps/glossary/index.html
http://davidmlane.com/hyperstat/glossary.html
Useful Formulae

Standardizing values for:

The entire population

\[ Z = \frac{\bar{x} - \mu}{\sigma} \]

The sampling distribution

\[ Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}} \]

Calculating the confidence interval for:

\( \sigma \) unknown

\[ \bar{x} \pm \left[ t(s / \sqrt{n}) \right] \]

\( \sigma \) known

\[ \bar{x} \pm \left[ Z(\sigma / \sqrt{n}) \right] \]

Hypothesis testing for the mean

\( Z \) test of hypothesis for the mean (\( \sigma \) known)

\[ Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}} \]

\( t \) test of hypothesis for the mean (\( \sigma \) unknown)

\[ t = \frac{\bar{x} - \mu}{s / \sqrt{n}} \]

\( \sigma \) = population standard deviation
\( s \) = sample standard distribution
\( \bar{x} \) = sample mean
\( \mu \) = population mean

NOTE: You may also need to refer to table 3 the standardized normal distribution and table 4 the critical values of \( t \) from your textbook. The Graduate School of Management
The University of Western Australia

Data Analysis and Decision Making (DADM)
Assignment Cover Sheet

Please read carefully

In the course of your individual and group work assignments, you will encounter ideas from many sources. These will include journal and newspaper articles, commentaries, books, web sites and other electronic sources, original case sources, lecture materials, sources for information and ideas. All assignments that you submit must acknowledge these sources.

Not to acknowledge your sources is plagiarism. This refers to the misappropriation of the work or ideas of others and presenting them as your own. This is reprehensible from both an ethical and legal viewpoint. To avoid this, it is your responsibility to acknowledge all of your sources in any work submitted for assessment and it is essential that you reference the work of others correctly. Where you quote directly from a source, you must ensure that any direct quotations are placed in quotation marks and are fully referenced. Even when you do not quote directly, and are just referring to or expanding on the work of others, you must still acknowledge the sources of your information and ideas. If you have any doubts concerning appropriate referencing formats or how to acknowledge the work of others correctly, you should refer to the relevant course outline or seek the advice of your lecturers. These guidelines apply to all course assignments at the GSM.

It is GSM policy that no student will profit from plagiarism. Generally, a mark of ‘Fail’ will be recorded for the assignment in which this has occurred, regardless of its other merits or qualities. Serious or repeat cases will be referred to the Director of the GSM. Students should also note that the repeat cases of academic malpractice may be reported to the Sub-Dean on any relevant documentary evidence placed on the student’s permanent record.

In submitting this assignment and by signing below:

1. I/We declare that this written assignment is my/our own work and does not include (i) material from published sources used without proper acknowledgment or (ii) material copied from the work of other students.
2. I/We declare that this assignment has not been submitted for assessment in any other unit.
3. I/We confirm that this assignment complies with the GSM guidelines on acknowledgments and plagiarism which are specified in the unit outline and in this document.
4. I/We have a photocopy or electronic version of this assignment in my/our possession.

OPTIONAL (please tick if you agree)

☐ I/We agree to allow GSM staff to reproduce my/our work in part or in whole for use in the Assignment Writing Workshop and other study skills sessions. [Examples (both good and not-so-good) of students’ writing are useful because they are ‘authentic’. If your work is used names, student numbers, units, lecturers’ names and so on will all be removed so that no personal identification is possible.]

NAME(S): ________________________________

STUDENT NUMBER(S): ________________________________

ASSIGNMENT TOPIC: ________________________________

SIGNATURE (S) ____________________________________________