ECOM90009
Quantitative Methods for Business

SUBJECT GUIDE

Second Semester, 2014

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Subject Outline

Introduction

Welcome to Quantitative Methods for Business. This subject will introduce you to the principles and practices of collecting, presenting and analysing data. It illustrates the application of quantitative methods to the choices, decisions and problems faced by business managers, analysts and policy-makers. It introduces students to software used to analyse data, and provides an overview of the basic principles of statistics and the use of those principles in the context of business and policy analysis.

Subject Aims

The overall aim of this subject is to provide an overview of the basic principles for applying statistics to decision-making, insights into some important theoretical and practical issues concerning business statistics, and to demonstrate the value of business statistics in decision-making. While undertaking this subject, students will develop:

- the capacity to interpret and analyse both primary and secondary sources of data,
- the ability to make rational decisions based on the weight of statistical evidence,
- an understanding of the role statistical analysis plays in individual business decisions, and
- a familiarity with the role statistical analysis plays in the wider economic and policy framework within which businesses operate.

Prescribed References

The required textbook for this subject is:

Business Statistics: Australia / New Zealand
by Eliyathamby A. Selvanathan, Saroja Selvanathan, and Gerald Keller

All students are encouraged to purchase a copy of this textbook, as we will use it throughout the semester.

The text is available for purchase at the University Bookstore.

Copies are also available ON RESERVE at the Baillieu Library.

Learning Outcomes

Subject Objectives

On successful completion of this subject, students should be able to:

- explain how statistical theory applies to decision-making,
• explain how data is sampled, collected and presented using a range of summary measures,
• construct and analyse relevant measures of the random variation of data,
• construct and explain the implications of hypothesis tests and estimates of regression equations,
• explain some forecasting methods, and
• evaluate evidence to inform decision making.

To view the learning goals, generic skills and graduate attributes for your degree, please locate the University Handbook entry for your degree at: http://handbook.unimelb.edu.au/

Generic Skills

In this subject you will have the opportunity to develop important generic skills. These include:

• evaluation of ideas, views and evidence,
• synthesis of ideas, views and evidence,
• strategic thinking,
• critical thinking,
• application of theory to economic policy and business decision making,
• accessing economic and other information,
• summary and interpretation of information,
• application of Windows software,
• problem solving skills,
• negotiation and bargaining, and
• written communication.

Awareness Issues

At a broader level, studying this subject will increase your awareness of issues such as:

• the use and misuse of statistics in business, politics and the media;
• the importance of encouraging rational, evidence-based decision making in business and politics, and the vital role statistics plays in that process; and
• the value of empirical research as a complement to theoretical analysis in both academia and the business world.

Prerequisites

Entry into the Master of Management is the only prerequisite for this subject.
Academic Staff Contact Details

Seminar Leader Contact Details

Your co-ordinator for Quantitative Methods for Business is Dr Michael Coelli.

Email: mcoelli@unimelb.edu.au
Room: 342, 3rd floor, FBE Building, 111 Barry Street, Parkville
Phone: (03) 8344 8586

Consultation Hours: 3:00 pm to 4:00 pm on Mondays during teaching weeks

http://fbe.unimelb.edu.au/economics/staff/academic/376

Email Protocol

Please note that we are only able to respond to student emails coming from a University email address. Please do not use personal email addresses such as Yahoo, Hotmail or even business email addresses. Emails from non-University email addresses may be filtered by the University’s spam filter, which means that we may not receive your email. All correspondence relating to this subject will only be sent to your University email address. Note that you must first activate your University email address before you can send or receive emails at that address. You can activate your email account at this link:

http://accounts.unimelb.edu.au/

While academic staff endeavour to address queries received via email, it is more appropriate to resolve substantive questions during seminars and during normal consultation hours. With this in mind, we encourage students to attend all seminars and to familiarise themselves with the consultation hours offered by the seminar leader in this subject.

Seminars

Seminar Times

Mondays 1:00 pm – 3:00 pm FBE Building, Theatre 1 (ground floor)
Wednesdays 6:15 pm – 8:15 pm Law Building, GM15 Theatre (mezzanine level)

Seminar Participation Requirements

Students are expected to attend all seminars in their allocated stream throughout the semester: either Monday afternoon or Wednesday evening. Participation in discussion and analysis of examples is expected during these seminars.
## Seminar Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28-30 July</td>
<td>Fundamentals of Statistics: data, sampling and (some) descriptive statistics</td>
<td>Chapters 1 &amp; 2, 4.1, 5.1-5.3</td>
</tr>
<tr>
<td>2</td>
<td>4-6 August</td>
<td>More on Descriptive Statistics: association, presentation and Excel commands</td>
<td>Chapters 3 &amp; 5 4.2-4.4</td>
</tr>
<tr>
<td>3</td>
<td>11-13 Aug.</td>
<td>Probability and Discrete Distributions</td>
<td>6.1-6.4, 7.1-7.4, 7.6</td>
</tr>
<tr>
<td>5</td>
<td>25-27 Aug.</td>
<td>Point and Interval Estimation</td>
<td>11.1-11.5, 15.1</td>
</tr>
<tr>
<td>6</td>
<td>1-3 Sept.</td>
<td>Hypothesis Testing</td>
<td>13.1-13.4, 13.6, 15.1</td>
</tr>
<tr>
<td>9</td>
<td>22-24 Sept.</td>
<td>Regression Diagnostics, and Introducing Multiple Regression</td>
<td>18.4-18.5, 18.7 19.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MID-SEMESTER BREAK – 1 WEEK</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>6-8 October</td>
<td>Assessing Multiple Regressions, and Model Building</td>
<td>19.2-19.3, 20.1-20.2</td>
</tr>
<tr>
<td>11</td>
<td>13-15 Oct.</td>
<td>Time Series Analysis</td>
<td>Ch. 23 (excl. 23.4)</td>
</tr>
<tr>
<td>12</td>
<td>20-22 Oct.</td>
<td>Review</td>
<td></td>
</tr>
</tbody>
</table>

The required readings are taken from Edition 6 of the prescribed SSK textbook, described above. Students are encouraged to read the relevant chapters prior to the seminar each week, particularly if they have a very limited background in quantitative techniques.

## Seminar Slides

Seminar slides will be available for download from the subject’s LMS page prior to each seminar. The seminar slides are located under the heading “Seminar Slides”. Students should bring along a copy of these slides to the seminar. Students are also expected to take notes. Some important explanations of the material are not provided on the slides.
Using Echo360

Audio recordings of the Wednesday evening seminars delivered in this subject will be made available to students in the days following each Wednesday seminar. Audio recordings of seminars allow you to review seminars during the semester, or to revise in preparation for the mid-semester and end of semester exams.

You can access recorded seminars by clicking on the “Seminar Recordings” menu item in the LMS section for this subject. To listen to these recordings, you must install QuickTime 7 (or a later version) on your computer. Many students who use the seminar recordings find it helpful to be looking at the seminar slides as they listen.

Please note that lecture recordings are not a substitute for seminar attendance; rather they are designed for revision. On occasion the recording system can fail to record a seminar due to technical reasons. In such cases, the recording will not be made available.

Workshops

Workshop Schedule

Students are all expected to attend a one hour workshop each week. These workshops will commence in the second week of semester (week beginning Monday 4 August). The workshops are a fundamental component of the subject, and will give students the opportunity to practice the skills covered during seminars.

Students should check the Student Portal to find out the particular workshop time and location that they are allocated to, and should attend their allocated workshop only.

http://my.unimelb.edu.au

Students are able to change their workshop allocation via the Student Portal up to the end of the second week of semester (by Friday 8 August). Note that you can only change into a particular workshop if there is available space. For assistance with your enrolment, feel free to contact the Melbourne Business School student centre.

http://mbs.unimelb.edu.au/

Workshop Participation Requirements

A set of Preparation Questions are to be answered by students prior to the workshop each week. Students are to download these Preparation Questions from the subject’s LMS page. These Preparation Questions will be available on the LMS by the Thursday of the week prior to each relevant workshop, under the menu item “Workshop Questions”. The Preparation Questions include both theoretical and applied questions relating to the topic covered in the seminar in the previous week, and require students to discuss data and methods they are using to analyse data. Students are to bring their answers to the Preparation Questions to the workshop each week.

In the workshops, students will work in groups to answer a set of Workshop Questions provided by the tutor. These Workshop Questions often require students to discuss and
compare their different findings for the Preparation Questions, as well as attempting new questions.

Solutions to the workshop questions will be posted on the LMS after the end of each week, i.e. after all workshops that week have been completed.

Assessment

Assessment Overview

Your assessment for this subject comprises the following:

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Hard Copy or Electronic</th>
<th>Due Date</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Assignment</td>
<td>Electronic</td>
<td>Friday 22 August (week 4)</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-Semester Exam</td>
<td>n/a</td>
<td>Tuesday 9 September (week 7)</td>
<td>10%</td>
</tr>
<tr>
<td>Second Assignment</td>
<td>Electronic</td>
<td>Friday 26 September (week 9)</td>
<td>10%</td>
</tr>
<tr>
<td>Third Assignment</td>
<td>Electronic</td>
<td>Friday 24 October (week 12)</td>
<td>10%</td>
</tr>
<tr>
<td>End of Semester Exam</td>
<td>n/a</td>
<td>Assessment period</td>
<td>60%</td>
</tr>
</tbody>
</table>

Assignments

Detailed information on the contents of the three assignments will be provided during the semester via the LMS. You will have just two weeks to complete assignments, so it is important that you are well organized. The assignments may include written answer questions requiring both calculation and discussion, as well as questions requiring the use of software (Excel). The due dates for the three assignments are provided in the table above. Assignments not submitted by the due date and time (4 pm) will count as zero for assessment purposes, unless an extension has been granted by the Melbourne Business School prior to the due date.

Assignment answers can be submitted by a group of a maximum of four students, BUT all group members must be enrolled in the same workshop. Students will choose and form their own groups. For assignments submitted as a group, all students in the group, as long as they are all enrolled in the same workshop, will receive the same mark for the assignment. Students submitting an assignment with a group that is not in their own workshop, or in a group with more than four members, will not receive any credit for that assignment. Students may choose to work and hand in their assignments on their own, but I advise against it.

Students must submit their assignment answers electronically via the Assignment Tool. See below for details of how to submit assignments using this Tool. Each group will choose one group member to submit the assignment answers on behalf of the group. Assignments may involve undertaking quantitative analyses of real-world data using a spreadsheet package such as Excel. When including graphs or charts in assignments,
students should use patterns rather than colours to distinguish each data series in the graph or chart, as assignments will be printed in black and white for marking by tutors.

In the work for this subject, students are expected to not only obtain correct numerical results, but also to be able to explain clearly in words how those results were arrived at, what confidence we can have in them and what the results imply for management action or for policy. Assignment answers should be well written. It is also important that students do not report calculations, estimates or statistical tests that are unnecessary or inappropriate.

Mid-semester exam

This exam will take place on Tuesday 9 September at 12.15 pm in University Hall, Old Quad Building (G19). Please put it in to your diary now. It is not during lecture time.

The mid-semester exam contains only written answer questions requiring both calculation and discussion. The exam duration is 1 hour, including reading time, and is a closed book exam. Critical value tables for each distribution required to complete the exam will be provided to students in the exam package, as will a formula sheet. The exam will cover all material presented in seminars 1 to 5 inclusive.

Students should bring a standard scientific calculator with them to this exam, i.e. a calculator with the ability to take square roots and work with logarithms. Calculators that allow the user to retrieve text are not permitted.

End of semester exam

The end of semester exam for this subject will cover all the material covered during seminars and workshops throughout the semester. This exam will occur during the University's normal end of semester assessment period, with the specific time, date and location provided by the University's administration later in the semester. The exam will be 2 hours in duration, and will have written answer questions requiring both calculation and discussion. Critical value tables for each distribution required to complete the exam will be provided to students in the exam package, as will a formula sheet.

Students should also bring a standard scientific calculator with them to this end of semester exam. Calculators that allow the user to retrieve text are again not permitted.

Exam Policy

The end of semester examination period for this semester is from Monday 3 November until Friday 21 November, 2014.

The Faculty requires that students are available for the entire examination period. Supplementary exams will not be provided in cases of absence during the examination period, unless the absence is due to serious illness or other serious circumstances. See the Special Consideration web site for more information:

http://fbe.unimelb.edu.au/csc/assistance/special_consideration
Using the Assignment Tool

The Assignment Tool allows students to submit assignments online from home or from any of the student computer laboratories on campus. During the course of the semester, students will be asked to submit assignments in electronic format into the Assignment Tool. The Assignment Tool can be accessed by clicking on the Assignment Tool menu item from the LMS page for this subject.

A student guide has been prepared on the use of the Assignment Tool. The guide provides instructions on how to submit individual assignments, how to form groups and how to submit group assignments. The guide can be downloaded here:


Please note that students are required to keep a copy of their assignment after it has been submitted, as students must be able to produce a copy of their assignment at the request of their tutor or subject coordinator at any time after the submission due date.

Plagiarism and Collusion

Presenting material from other sources without full acknowledgement (referred to as plagiarism) is heavily penalised. Penalties for plagiarism can include a mark of zero for the piece of assessment or a fail grade for the subject.

Plagiarism is the presentation by a student of an assignment identified as his or her own work even though it has been copied in whole or in part from another student’s work, or from any other source (e.g. published books, web-based materials or periodicals), without due acknowledgement in the text.

Collusion is the presentation by a student of an assignment as his or her own work when it is, in fact, the result (in whole or in part) of unauthorised collaboration with another person or persons. Both the student presenting the assignment and the student(s) willingly supplying unauthorised material are considered participants in the act of academic misconduct. See the following website for more information.


Late Submission

Where a student's capacity to prepare a piece of assessment has been affected by factors beyond their control, such as illness or some other unexpected occurrence, students may apply for an extension. To apply for an extension, students should contact the Melbourne Business School (MBS) student centre. Students should make such applications well before the assignment is due.

Note that if an assignment in this subject is submitted after the due date and time without the student being granted an extension by the MBS, the assignment will count as zero for assessment purposes.
Special Consideration

Students who have been significantly affected by illness or other serious circumstances during the semester may be eligible to apply for Special Consideration. The following website contains detailed information relating to who can apply for Special Consideration and the process for making an application:

http://fbe.unimelb.edu.au/csc/assistance/special_consideration

Note that applications for special consideration must generally be made within 3 working days of the assessment for which special consideration is being requested.

Group Work

Working in groups can sometimes be more difficult than working individually. However, teamwork and organisational skills associated with group work are highly valued by employers. With careful management and ongoing communication, you can have a successful and rewarding experience working in a team.

You should exchange names, phone numbers, and email addresses with your group members straight away. If you have difficulty with a member of your group, you should contact your tutor as soon as possible. Do not leave issues unresolved until just before or after your group assignment is due.

All students within your group will be given the same mark for an assignment submitted as a group, so choose your group members wisely. Remember, all group members must be enrolled in the same workshop.

Other Subject Resources

The following resources are provided to assist your learning.

Tutors

Workshops provide an opportunity for you to ask questions of your tutor.

If there is not enough time during workshops for you to have all your questions answered, ask your tutor to meet with you at a mutually convenient time for a further consultation.

Past Exams

Copies of the 2012 and 2013 mid-semesterm exams will be made available to students via the LMS in the week or two prior to the mid-semester exam. Brief solutions to these exams will also be provided.

Copies of the 2012 and 2013 end-of-semester exams will be made available to students via the LMS towards the end of semester. Brief solutions for these past exams will also be provided.
FBE Centre for Excellence in Learning and Teaching Helpsheets

The Centre provides an extensive range of helpsheets that can enhance your academic performance in Business and Economics. These are available online or at the Centre.

https://www.online.fbe.unimelb.edu.au/learningresourceslu/

Other Information

How to succeed in QMB

In order to succeed in Quantitative Methods for Business, the following are recommended.

- Keep up with the work from week to week, including reading the relevant textbook chapters and attending seminars.
- Work through workshop problems before and after each workshop. Make sure that you have no unanswered questions.
- Do a number of textbook exercises. This will vary from student to student. If you are confident in your mastery of techniques, concentrate on the Applying the techniques and Supplementary questions.
- Rely on yourself. Your tutors and the subject co-ordinator are here to facilitate your learning, but we cannot do the learning for you.