

THE UNIVERSITY OF
NEW SOUTH WALES



Australian School of Business
School of Economics

Econ1202/Econ2291
Quantitative Methods A

Course Outline
Semester 2, 2009

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1 STAFF CONTACT DETAILS

Lecturer-in-charge:

Dr. Chris Bidner
Room QUAD 3119
Phone No: 9385 5911
Email: c.bidner@unsw.edu.au

Tutor-in-charge:

Mr. Louis Yeung
Room: Quad Building Q3122
Telephone: 9385 3286
Email: louis.yeunglamko@unsw.edu.au

A full list of tutors will be posted on Course Website.

1.1 Communications with staff

Consultations are an opportunity for you to ask questions. You may need to ask about the material introduced in lectures, the problems you have attempted or questions that were not fully answered in tutorials.

You should feel free to contact your lecturer about any academic matter. However, I strongly encourage, for efficiency, all enquiries about the subject material be made at lectures or tutorials or during consultation time. Discussion of course subject material will not be entered into via lengthy emails.

Consultations with the individuals mentioned above can be made in their offices. A list of consultation times will be posted on the course website.

Email correspondence on administrative matters (e.g. advising inability to attend tutorial) will be responded to within 48 hours, but not over weekends. Please note that the lecturer-in-charge has no advance notice of the date and time of the exam.

Emails to the lecturer-in-charge and the tutor-in-charge MUST have a clear subject line and MUST be done via QMA WebCT vista.

Email enquiries should be directed to the QMA staff as follows:

- Lecture-related enquires to your lecturer;
- Tutorial material enquiries to your tutor/tutor-in-charge/lecturer;
- Course related issues and enquiries about special consideration, assessments and examination to the lecturer-in-charge;
- Administrative enquiries about the tutorials to the tutor-in-charge.

1.2 Pitstop

Pitstop provides an opportunity for consultation with tutors. It will start in Week 3 and continue till Week 13. The schedule of Pitstop times for this course will be announced on Course Website.

2 COURSE DETAILS

2.1 Teaching Times and Locations

Stream	Day	Time	Location	Lecturer
A	Mon	3pm-4pm	Keith Burrows Theatre	Yeung
	Wed	4pm-5pm	Keith Burrows Theatre	
B	Mon	6pm-8pm	Central Lecture Block 8	Bidner

Tutorials Start in **Week 1**. A full list of tutorials, times and tutors will be on the Course Website.

2.2 Units of Credit

The course is worth 6 units of credit.

2.3 Summary of Course

This course examines: mathematics of finance: (compound interest, present value, annuities); matrix algebra: (operations with matrices, determinants, matrix inverse, rank, solutions to matrix equations); the graphical approach to linear programming; calculus: (univariate differentiation, maxima and minima of a function, functions of several variables, partial derivatives, unconstrained and constrained optimisation) and the applications of the above concepts and techniques in accountancy and economics, including the use of spreadsheet computer programs.

2.4 Aims and Relationship to Other Courses

Quantitative Methods A (QMA) is one of the six core courses undertaken by undergraduate students in the Australian School of Business and is offered as part of the first year core in the B.Com and B.Econ degrees. It is a prerequisite for ECON1203 Quantitative Methods B (QMB), which will build on the probability area of QMA as well as introducing new statistical techniques. QMA is designed to give students a good insight and understanding of how mathematical concepts, theories and techniques are applied to the fields of business, economics and the social sciences in order to generate solutions to problems encountered in these fields. The course content constitutes the minimum mathematical knowledge and skills that graduates from the Faculty should possess in order to be effective in their later studies at UNSW, and in the world of work.

After completing both QMA and QMB, your use of mathematics and statistics in your studies will vary depending on the major(s) you choose. If you choose majors such as Economics, Financial Economics and Business Statistics you will study further courses in econometrics. These majors are designed to equip students with statistical and other quantitative skills that are widely used and increasingly demanded by employers in commercial fields and the public sector.

If you choose other majors where quantitative skills are needed, such as Accounting, Finance and Marketing, a good understanding of concepts taught in QMA and QMB will be essential.

In this course we build on mathematical knowledge which you should have gained in high school. The aim of the course is to develop quantitative abilities and mathematical skills essential for the practice of business and economics. The knowledge and training you will

develop in this course form a solid and necessary foundation for many other disciplinary areas within the Australian School of Business. The aims of this course are for you to:

- Gain experience in areas which every business person needs such as problem solving and using a spreadsheet;
- Develop your ability to perform calculations;
- Develop your ability to solve real life business problems using formal mathematical tools and algorithms;
- Extend your skills in analysis, oral and written communication.

2.5 Assumed knowledge

The level of assumed knowledge in mathematics required for this subject is the New South Wales (NSW) HSC Mathematics. As is stipulated in the UNSW Undergraduate Handbook, under the headings ECON1202 and ECON2291:

Assumed knowledge: A level of knowledge equivalent to achieving a mark of at least 60 in HSC Mathematics. Students who have taken General Mathematics will not have achieved the level of knowledge which is assumed for this course.

If you have not studied HSC mathematics in New South Wales, knowledge of the following topics is essential: algebra (including logarithms, exponentials, functions and graphs), derivatives and differentiation rules, and simple integration.

If you have not studied any or all of these topics previously, i.e., an appropriate level of mathematics at high school, remedial work will be necessary. This may imply not taking Quantitative Methods A this session but taking a Mathematics Skills Program offered by the University instead. For further details about the Mathematics Skills Program, you should contact the Admissions Office of the University.

If you meet the assumed knowledge requirement, but feel the need for a refresher course in elementary algebra and calculus, you may wish to purchase the following book available at the UNSW bookshop: *Managing Mathematics: A Refresher Course for Economics and Commerce Students* by Judith Watson, 2nd edition, 2002.

Week 1 Tutorial will review some concepts from “Lecture 2” which represent the assumed knowledge for this course. Please talk to your tutor and lecturer during consultation times if you need help with this material.

2.6 Student Learning Outcomes

On successful completion of this course, you should be able to:

1. Apply basic principles of financial mathematics to real life problems;
2. Apply probability tools to solve risk and uncertainty scenarios;
3. Use matrix algebra to represent and solve systems of equations;
4. Use linear programming and calculus to solve optimisation problems;
5. Apply both single variable and multivariable calculus to business and economics problems;
6. Use Excel spreadsheet proficiently to analyse data and make correct interpretations of the program's output;
7. Communicate successfully with group members in solving analytical problems. Such skills in analytical thinking and effective communication are Graduate Attributes that UNSW seeks to foster in its graduates.

Graduate Attributes

Course Learning Outcomes	ASB Graduate Attributes
1-6	1. Critical thinking and problem solving
7	2. Communication
7	3. Teamwork and leadership
n.a.	4. Social, ethical and global perspectives
1-6	5. In-depth engagement with relevant disciplinary knowledge
1-6	6. Professional skills

3 LEARNING AND TEACHING ACTIVITIES

3.1 Approach to Learning and Teaching in the Course

The philosophy underpinning this course and its Teaching and Learning Strategies are based on “Guidelines on Learning that Inform Teaching at UNSW”. These guidelines may be viewed at: www.guidelinesonlearning.unsw.edu.au. Specifically, the lectures, tutorials and assessment have been designed to appropriately challenge students and support the achievement of the desired learning outcomes. A climate of inquiry and dialogue is encouraged between students and teachers and among students (in and out of class). The lecturers and tutors aim to provide meaningful and timely feedback to students to improve learning outcomes.

This is not a course where you can become proficient just by observing. You will need to get involved in class - evaluating information, asking and answering questions. You also must learn to organise your independent study and practise enough problems to gain a thorough understanding of concepts and how to apply them.

You are expected to

- put a consistent effort into learning activities throughout the session by preparing for the more regular assessment tasks,
- take a more responsible role in preparing for tutorials and participating in them,
- develop communication skills through engaging in classroom discussions and preparing an assignment,
- concentrate on understanding how and why to use formulas and less on memorising them,
- learn to work effectively with other students in order to complete a computer-based business assignment,
- make continuous improvements by using the feedback from assessments.

3.2 Learning Activities and Teaching Strategies

The examinable content of the course is defined by the references given in the Lecture Schedule, the content of Lectures, and the content of the Tutorial Program.

In this course there are two types of formal classes: lectures and tutorials. There is also an Excel computing component which you may choose to undertake independently using your home computer or by obtaining the assistance of a tutor in a computer laboratory on campus.

There are also peer assisted study groups (PASS) which you can attend on a voluntary basis. In addition you will be expected to spend a considerable amount of extra time working with group members on your assignment and working on your own to attempt tutorial preparation and self study questions.

3.2.1 Lectures

The purpose of Lectures is to provide a logical structure for the topics that make up the course; to emphasize the important concepts and methods of each topic. They will include explanation of relevant topics and theory together with the use of worked examples to demonstrate the theory in practice. Where possible, lectures will show the relevance and application of the quantitative techniques covered in this course to business, economic and financial applications.

To get the most out of the lectures, students are strongly encouraged to familiarise themselves with the prescribed text readings as given in the course outline prior to attending each lecture, and to be prepared to take notes during the lecture itself. A “book” of lecture outlines, with space for working, is available from the course website. The “book” is also available for purchase from the UNSW Bookshop. While some students prefer to take their own notes, others will prefer to use the outline as a template for their notes, annotating or emphasising points as they wish.

Due to the size of lecture classes and the large amount of course material to be covered there is only a very limited time for questions to be answered during the lectures themselves. However, the smaller tutorial classes (see below) are ideal forums for students to test their understanding and seek further instruction. Additionally, consultation times with lecturers can be used by students to clarify the lecture material.

3.2.2 Tutorials

Tutorials begin in Week 1 and are an integral part of the subject. Tutorial presentations/discussion questions/problems will build on the material discussed in class with the lecturer.

The purpose of tutorials is to help increase your understanding of the material covered in lectures once you have tried to work through some numerical problems yourself.

Focus

Besides learning practical problem-solving skills, there is an emphasis on the development of communication skills and the ability to construct arguments. Discussions, both in small groups and between the whole class, will be an opportunity for you to examine your understanding of concepts and applications before working on numerical examples.

Preparation

Each week you will be given two sets of questions to work on.

Tutorial questions must be prepared for your tutorial. Expect that your tutor or another student will check that you have attempted these. You are expected to attend the tutorials and discuss any difficulties you encountered solving the tutorial questions with your tutor. Solutions to these tutorial questions will be available on QMA website on the Friday on each week after 4pm.

Self study questions will also be set for each week. Attempting these will assist you in answering the tutorial questions and will form a necessary part of the practice you will need to do to successfully complete this course. Solutions to some of these questions will be posted on QMA website before the examination time.

Further help in understanding the tutorial solutions and in solving the self study problems can be obtained through consultations with your lecturer and tutor.

Discussion

The first part of your tutorial will involve discussion questions related to the numerical questions you have prepared. These will help you improve your understanding of concepts and mathematical methods and assist you to see the relevance of these in business and economics. In some weeks you may also discuss topics such as how to approach your group assignment. During this part of the tutorial, you may also suggest topics you would like to be discussed, for example areas where you are confused or need more explanation.

Numerical solutions

During the second part of the tutorial the students and tutor working together will examine the solutions to the prepared questions. If time permits, extra questions may be attempted. In the case where there is not time to work through all the prepared questions, answers to these questions (but not complete solutions) will be made available at the end of each week on the QMA website.

Tutorials take place every week starting from **Week 1**. Students enrolled in ECON2291 should see the Tutorial Co-ordinator as soon as possible to be assigned to a tutorial.

3.2.3 Computing component

Given that most students have access to their own personal computers and the Excel program we are not insisting that you attend laboratory sessions on campus in order to become proficient in using this program. You will have the opportunity to either work through a set of computing exercises on your own at home or to attempt them at university. The exercises will be training for the Excel tasks required in your computing assignment as well as showing you other applications related to the course that may be required for tutorial work.

From the QMA website you will be able to download the computing exercises as pdf files.

You may use the laboratories during times booked for QMA to work with your group on your assignment. For some of these lab times, an instructor will be available to assist you with questions about the use of Excel. See the course website for the lab schedule.

If you need to print at your university lab you should first obtain a printing card from the machine outside Quad Lab 4. The card costs \$5 and has \$3.35 of printing credit, enough for approximately 25 pages. Extra funds may be added to the card as needed.

3.2.4 PASS groups

PASS (the Peer Assisted Support Scheme) is a system of voluntary study groups available to QMA students. The groups are each led by senior students and are an opportunity to practise problems, develop study methods, ask questions, and consolidate your knowledge in a friendly informal environment.

The PASS timetable will be distributed in lectures in week 2 and be placed on the QMA website.

3.2.5 Out-of-Class Study

While students may have preferred individual learning strategies, it is important to note that most learning will be achieved outside of class time. Lectures can only provide a structure to assist your study, and tutorial time is limited.

Outside the classroom you need to undertake several hours a week of independent study. While these tasks have been referred to in other sections it is good to focus here on what a typical week might need. You should expect to carry out these tasks:

1. Read sections of the textbook and or reference texts and read lecture notes before/after the lecture;
2. Attempt the self study problems and compare your methods with the online solutions, try the online practice problems to prepare for quizzes or the past exam papers to prepare for exams; try extra problems from the textbook if required;
3. Prepare tutorial questions;
4. Develop skills in using Excel by attempting the computing exercises;
5. Take the online quiz, look at your results and if necessary carry out further preparation before re-attempting it;
6. Work with other group members on the computing assignment;
7. Seek assistance from staff, PASS leaders or fellow students to have queries answered.

4 ASSESSMENT

4.1 Formal Requirements

In order to pass this course, you must:

- achieve a composite mark of at least 50 out of 100; and
- make a satisfactory attempt at **ALL** assessment tasks (see below).

4.2 Assessment Details

Assessment Task	Weight	Learning Outcomes assessed	ASB Graduate Attributes assessed	Length	Due Date
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Online quizzes	4 x 1%	1,2,3	1,2,5,6	See 4.4	Weeks 3, 5, 9, 12
In-tutorial Tests	2 x 12%	1,2,3	1,2,5,6	See 4.5	Weeks 4, 8
Assignment Part A	6 %	1,2,3,6,7	1,2,5,6	See 11	Week 7 Tutorial
Assignment Part B	6 %	1,2,3,6,7	1,2,5,6	See 11	Week 10 Tutorial
Final Exam	60%	1,2,3,4	1,2,5,6	3 hours	Exam Period
	100%				

4.3 Tutorial Attendance

You are expected to complete at least 80% of tutorial attendance as required by UNSW and ASB rules. Attendance at 9 of 12 tutorials will be deemed as meeting the requirement. Students must sign on by 20 minutes from start of tutorial to qualify as 'in attendance'. Signing on for another student will be treated as misconduct.

Although attendance does not enter your final mark **it is a prerequisite** for any special consideration request you apply for.

4.4 Four online quizzes

The online quizzes have been designed to assist you to learn, so you can practise, check your understanding of topics and improve on your first attempt if necessary. Before completing each quiz you will have the opportunity to try online self-check practice questions that are similar in content to the topics to be examined. The format of the practice questions will be a mixture of multiple-choice and true-false questions. You can try them as many times as you like at different times through the semester.

Each of the online quizzes will consist of eight to ten questions. You will need to perform calculations similar to those in the practice set but enter numerical answers rather than checking a box. In order to avoid rounding errors you should try to store as much information in your calculator's memory as possible. You will be allocated a time limit of one hour to complete each attempt and you may have two attempts at each quiz. For the second attempt, you may not get exactly the same set of questions or data.

For each quiz your highest mark will be recorded and will count towards 2% of your assessment total.

Quizzes will test material up and including lectures ending the previous week. These are the dates between which quizzes will be available online:

Quiz 1 – Week 3: Monday 3/8/09 – Sunday 7/8/09

Quiz 2 – Week 5: Monday 17/8/09 – Sunday 23/8/09

Quiz 3 – Week 9: Monday 21/9/09 – Sunday 27/9/09

Quiz 4 – Week 12: Monday 12/10/09– Sunday 18/10/09

You can access the quizzes at the QMA website, <http://vista.elearning.unsw.edu.au/webct/> by clicking on the quizzes link. It is a good idea to save each answer as you progress through the questions in case your internet connection fails.

Do not leave it until Sunday night to begin your first quiz attempt as overuse of the website may cause access problems.

You are encouraged to make your attempts at UNSW computing labs. There are no supplementary quizzes. You are given two attempts to cover for any unseen technical problems that may cause you to lose one attempt. You may contact the lecturer-in-charge **if and only if** you lose the two attempts due to technical problems (connecting to Vista, Vista shut down...) encountered in a **UNSW computer lab**. No considerations will be given if you leave your two attempts till Sunday evening!

4.5 In-tutorial tests

There will be 2 written tutorial tests in weeks 4 and 8. You will be notified by your lecturer of the time given to complete each test, as well as the material covered. This announcement will be made in lectures during the week before the test. This information will also be posted on QMA website.

In tutorial test 1 August 10 – August 15 (Week 4)

In tutorial test 2 September 14 –September 19 (Week 8)

A sheet with a number of selected formulae will be provided. This sheet will be available for download from the course website prior to the exam. The main purpose of these tests is to gauge:

- Knowledge of the topics covered so far. Thus help achieve learning outcomes **1** and **2**;
- Ability to use formulae appropriately and to perform calculations with speed and accuracy. Thus help in developing analytical skills that are necessary to achieve learning outcome **3**;
- Problem solving ability.

Students must sit the tutorial tests in the tutorial group to which they have been allocated. **No supplementary in-tutorial tests will be offered.** Students who do not attend and do not have adequate reason will be awarded a mark of zero.

Documentary evidence for an absence (e.g. medical certificate) must be provided to the Lecturer-in-charge. If approved, the student will have their final mark re-weighted according to the weight of the missed piece of assessment.

Regardless, an absence will only be approved for one of the in-tutorial tests.

4.6 Assignment Assessment and Format

The assignment topics, format and marking criteria are set out in 11 below.

4.7 Assignment Submission Procedure

1. Each group must submit 1 hard copy of their assignment.
2. The hard copy is to be submitted to the Tutor in the tutorial class in the week beginning for Part A and for Part B.
3. Each group is required to submit an assignment cover sheet indicating the tutor's name and group members' names and IDs. These cover sheets can be downloaded from QMA website. See section 11 for more details.

4.8 Late Submission of Assignment

Penalty for late submission of either Part A or Part B will be one mark per working day. Assignments submitted more than five days late will not be marked.

4.9 Final Exam Format

The final will be a three hour examination held during the period university examination period. It will be worth 60% of the overall mark for the course, and will cover material from the entire course. There are no multiple choice questions in the final examination. The final exam consists of a number of questions designed to test your analytical skills and your problem solving ability. As with the in-tutorial tests, a sheet with a number of selected formulae will be provided. Full information about the content and format of the final examination will be provided towards the end of the semester.

Past exam papers for this subject are useful for your preparation and to gauge your knowledge and understanding of the concepts covered. However due to recent changes to the course content and format due to the move to the 12 weeks session, you should be advised that they are by no means indicative of the exact material to be covered in the current final exam.

As outlined in 3.2 above all material covered in the lectures and tutorial program is examinable.

5 ACADEMIC HONESTY AND PLAGIARISM

The University regards plagiarism as a form of academic misconduct, and has very strict rules regarding plagiarism. For UNSW's policies, penalties, and information to help you avoid plagiarism see: <http://www.lc.unsw.edu.au/plagiarism/index.html> as well as the guidelines in the online ELISE tutorial for all new UNSW students: <http://info.library.unsw.edu.au/skills/tutorials/InfoSkills/index.htm>.

6 COURSE EVALUATION AND DEVELOPMENT

Each year feedback is sought from students and other stakeholders about the courses offered in the School and continual improvements are made based on this feedback. UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process is one of the ways in which student evaluative feedback is gathered. You are strongly encouraged to take part in the feedback process.

7 STUDENT RESPONSIBILITIES AND CONDUCT

Students are expected to be familiar with and adhere to university policies in relation to class attendance and general conduct and behaviour, including maintaining a safe, respectful environment; and to understand their obligations in relation to workload, assessment and keeping informed.

Information and policies on these topics can be found in the 'A-Z Student Guide': <https://my.unsw.edu.au/student/atoz/ABC.html>. See, especially, information on 'Attendance and Absence', 'Academic Misconduct', 'Assessment Information', 'Examinations', 'Special Consideration', 'Student Responsibilities', 'Workload' and policies such as 'Occupational Health and Safety'.

7.1 Workload

It is expected that you will spend at least **ten hours** per week studying this course. This time should be made up of reading, research, working on exercises and problems, and

attending classes. In periods where you need to complete assignments or prepare for examinations, the workload may be greater.

Over-commitment has been a cause of failure for many students. You should take the required workload into account when planning how to balance study with employment and other activities.

7.2 Attendance

Your regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty per cent of scheduled classes they may be refused final assessment.

7.3 Special Consideration and Supplementary Examinations

You must submit all assignments and attend all examinations scheduled for your course. You should seek assistance early if you suffer illness or misadventure which affects your course progress. For advice on UNSW policies and procedures for granting special consideration and supplementary exams, see:

‘UNSW Policy and Process for Special Consideration’:

<https://my.unsw.edu.au/student/atoz/SpecialConsideration.html>

Students should note the following

- Applications for special consideration (including supplementary examinations) must go through UNSW Central administration (within 3 working days of the assessment to which it refers) – applications will **not** be accepted by teaching staff;
- Applying for special consideration does not automatically mean that you will be granted additional assessment or that you will be awarded an amended result;
- If you are making an application for special consideration (through UNSW Central Administration) please notify your Lecturer in Charge;
- Please note that a register of applications for Special Consideration is maintained. History of previous applications for Special Consideration is taken into account when considering each case.

ASB Policy and Process for Special Consideration and Supplementary Exams

In the case of undergraduate students in the ASB, requests for special consideration are determined by a Faculty wide panel. If the Faculty panel grants a special consideration request, this may entitle the student to sit a supplementary examination. In such cases the following procedures will apply:

- Supplementary exams will be scheduled centrally and will be held approximately two weeks after the formal examination period. Actual date will be advised by mid-semester.
- Where a student is granted a supplementary examination as a result of a request for special consideration, the student’s original exam (if completed) will not be marked and only the mark achieved in the supplementary examination will count towards the final grade.

The 'ASB Policy and Process for Special Consideration and Supplementary Exams in Undergraduate Courses' is available at:

<http://www.docs.fce.unsw.edu.au/fce/current/StudentSuppExamProcedure.pdf>.

Further information for undergraduate students is on the ASB website (see '[Policies and Guidelines for Current Students](#)').

7.4 General Conduct and Behaviour

You are expected to conduct yourself with consideration and respect for the needs of your fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students may be asked to leave the class. More information on student conduct is available at: www.my.unsw.edu.au

7.5 Occupational Health and Safety

UNSW Policy requires each person to work safely and responsibly, in order to avoid personal injury and to protect the safety of others. For more information, see <https://my.unsw.edu.au/student/atoz/OccupationalHealth.html>.

7.6 Keeping Informed

You should take note of all announcements made in lectures, tutorials or on the course web site. From time to time, the University will send important announcements to your university e-mail address without providing you with a paper copy. You will be deemed to have received this information. It is also your responsibility to keep the University informed of all changes to your contact details.

8 STUDENT RESOURCES AND SUPPORT

The University and the ASB provide a wide range of support services for students, including:

- **ASB Education Development Unit (EDU)** (www.business.unsw.edu.au/edu)

Academic writing, study skills and maths support specifically for ASB students. Services include workshops, online and printed resources, and individual consultations. EDU Office: Room G07, Ground Floor, ASB Building (opposite Student Centre); Ph: 9385 5584; Email: edu@unsw.edu.au

- **UNSW Learning Centre** (www.lc.unsw.edu.au)

Academic skills support services, including workshops and resources, for all UNSW students. See website for details.

- **Library training and search support services:** <http://info.library.unsw.edu.au>
- **UNSW IT Service Desk:** Technical support for problems logging in to websites, downloading documents etc. Library, Level 2; Ph: 9385 1333.

Website: www.its.unsw.edu.au/support/support_home.html

- **UNSW Counselling Service** (<http://www.counselling.unsw.edu.au>)

Free, confidential service for problems of a personal or academic nature; and workshops on study issues such as 'Coping With Stress' and 'Procrastination'.

Office: Level 2, Quadrangle East Wing ; Ph: 9385 5418

- **Student Equity & Disabilities Unit** <http://www.studentequity.unsw.edu.au>)
Advice regarding equity and diversity issues, and support for students who have a disability or disadvantage that interferes with their learning. Office: Ground Floor, John Goodsell Building; Ph: 9385 4734

9 COURSE RESOURCES

The website for this course is on WebCT Vista and can be accessed via <http://vista.elearning.unsw.edu.au/webct/>.

The Lecture Book

A lecture book which compiles all the lecture notes is available for purchase from the UNSW bookshop. You are encouraged to use this book to take notes as the lecture progresses. The lectures examples are not worked out in the book and you should take notes as the lecturer explains the solution in class.

Please be advised that because of time constraint we will not be able to cover all the examples of the lecture book in lecture times. You may approach your lecturer/tutor for help on how to approach these examples.

The textbook(s) for this course are

Prescribed text	Comment
Haeussler, E.F. Paul, R.S and Wood, R.J., <i>Introductory Mathematical Analysis for Business, Economics and the Life and Social Sciences</i> 12th ed., 2008	Text and (optional) student solution manual, which contains solutions to the odd numbered questions, are both available at the UNSW bookshop and in MyCourse reserve in the library.

Students may also find the following textbook useful for some parts of the course.

Reference texts	Comment
Knox, D.M. Zima, P. and Brown, R.L., <i>Mathematics of Finance</i> , 2 nd ed , 1999 McGraw-Hill, Sydney.	This book is highly recommended reading for the financial maths section and in particular for topics from lectures 8 and 9 which are not in the textbook. Available in MyCourse reserve and at the UNSW Bookshop.
Morris, C., <i>Quantitative Approaches in Business Studies</i> , 6th ed. 2003. Financial Times Prentice Hall, New York	This book has an easy to read style. It is an excellent resource for the linear programming and decision theory topics. Available in MyCourse reserve.
Shannon, J <i>Mathematics for Business Economics and Finance</i> 1995 John Wiley & Sons, Brisbane.	Useful for the matrix algebra section. Available in MyCourse reserve and at the UNSW Bookshop.
Watson, J. <i>Managing Mathematics: A</i>	Recommended for those who have

<i>Refresher Course for Economics and Commerce Students</i> 2nd ed. 2002 , School of Economics, UNSW.	previously gained the assumed knowledge of mathematics, but who now need to refresh algebra or calculus. Available at the UNSW Bookshop.
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Note that in the Lecture Schedule below and in the Tutorial Booklet these texts are referred to according to the initials of their authors as HPW, KZB, CM and JS.

Calculator

A basic scientific calculator is required for this course. Usually the calculator you used at school will be satisfactory. It must be able to perform logarithmic and exponential calculations such as $\ln x$ and x^y . The calculator must not be a programmable one (i.e. have a full alphabetic keyboard) or a financial one.

If you need to purchase a new calculator, keep in mind that for Quantitative Methods B, it will be desirable to have a two variable statistical mode to perform linear regression calculations.

Software

If you wish to complete the computing requirements of this course using your own computer rather than the university laboratories you will need to have the Microsoft Excel program installed. Make sure that you install the full version that enables add-ins to be used.

10 LECTURE SCHEDULE

The table below shows the lectures covered each week. For example “L5” corresponds to Lecture 5 in the lecture book. Additional readings are from the HPW and KZB (see Section 9).

Week	Lecture		Refs
1	L1	Introduction to QMA	Lecture book
	L2	Assumed Knowledge: Tutorial of WEEK 1	HPW 2.1-2.5; HPW 4.1-4.4; HPW 10.4, 11.1-11.5
	Topic 1: MATHEMATICS OF FINANCE		
	L3	Simple & compound interest Continuous compounding Effective rate of interest	HPW 5.1, 5.3 KZB 1.1, 2.1-2.2, App.D, HPW pp. 199
2	L4	Present/Future value; Equations of value	HPW 5.2, KZB 1.4, 2.3, 2.6
	L5	Net present value; Internal rate of return	HPW pp.204-205 KZB 8.1, 8.2
	L6	Geometric progressions Ordinary annuities Annuities due	HPW 5.4 KZB 3.1-3.4, App.B
3 Quiz 1	L7	Sinking funds	HPW 5.5 KZB 6.1-6.3,7.8
	L7	Loan amortization	HPW 5.5 KZB 6.1-6.3,7.8

4 In-tutorial Test 1	L8	General annuities, Perpetuities Deferred annuities	KZB 3.5-3.7, 5.1-5.4
	L9	Depreciation Methods Linear, constant percentage, sinking fund	KZB 8.4
5 Quiz 2	Topic 2: PROBABILITY		
	L10	Introduction to Probability Sample space, Conditional Probability, Rules of Probability	Notes to be posted on QMA website in Week 4
	L11	Probability Trees, Decision theory, Bayes' Theorem	HPW 8.5- 8.7 CM 8
6	Topic 3: MATRICES		
	L12	Introduction to matrices Transpose, diagonal, identity, zero Matrix algebra: addition, subtraction Multiplication: scalar, matrix	HPW 6.1- 6.3 JS 4.1-4.4
	L13	Small matrices: Matrix Inversion, Adjoint method Solving systems of Linear Equations Consistency, types of solutions	HPW 6.6 JS 4.6-4.7, 4.9
7 Assignment Part A Due	L14	Large matrices: Computing methods Arrays, inversion, other methods	HPW 6.1-6.3
	Topic 4: LINEAR PROGRAMMING		
	L15	Graphical approaches	HPW 7.1 CM 19
8 In-tutorial Test 2	L16	Changes in the constraints Changes in the objective function Applications	HPW 7.3
	Topic 5: CALCULUS		
	L17- L18	Differentiation rules overview Applications (marginal c/r, elasticity) Differentials	HPW 10.4, 11.1-11.5, 12.3 HPW 12.1-12.2, 12.4- 12.5, 12.7, 14.1
9 Quiz 3	L19	Relative extrema Concavity, convexity Local, global extrema Inflection points	HPW 13.1, 13.3- 13.4, 13.6
	L20- L21	Introduction to integration The indefinite integral The definite integral Introduction to differential equations Method of separation of variables	HPW 14.2-14.5, 14.6- 14.7, 14.10

10 Assignment Part B Due	L21- L22	Exponential growth Limited growth Logistic growth Applications	HPW 15.5
	L23	Introduction to multivariable calculus Level curves Partial & total derivatives	HPW 15.6
11		No Lectures (due to Public Holiday on Monday)	
12 Quiz 4	Topic 6: OPTIMIZATION		
	L24	Unconstrained optimization in 2 variables	HPW 17.1-17.6
	L24	Constrained optimization	HPW 17.7, 17.8
13	L24	Further examples in optimization	HPW 17.8
		REVIEW	Check Website

11 ASSIGNMENTS

The purpose of this assignment is to let you experience some of the decision making that is commonly undertaken in business situations. It will help you to build skills in using Excel spreadsheets and in analysing results and thus achieving learning outcome 6.

We hope that you will also develop skills in working with other students and time management, which are valuable for future employment and are part of learning outcome learning outcome 7.

Assignment timeline

Week 2	Jul 27	The assignment question and instructions will be placed on the QMA website. Formation of groups will be discussed in tutorials. Groups must contain 1-4 persons from the same tutorial. While students may elect to complete the assignment by themselves, learning to work with others and complete it as a group of 2-4 would be beneficial.
Week 3	Aug 3	Registration of group members must be made in each tutorial.
Week 7	Aug 31	Assignment Part A should be submitted to your tutor during your tutorial. Any late submissions should be given to the Lecturer-in-charge.
Week 8	Sept 14	Feedback on Part A and extra information for Part B to be handed out in each tutorial.

Week 10	Sept 28	Assignment Part B should be submitted to your tutor during your tutorial. Any late submissions should be given to the Lecturer-in-charge.
Week 12	Oct 12	Marked assignments will be returned to students in tutorials.

Although it is intended that the same members of a group will complete both Parts A and B of the assignment, if your group is unable to function effectively you may seek permission to change the group composition at the time Part A is submitted. If your tutor agrees the group may be split into smaller subgroups for the attempt on Part B.

Topics

- Part A Mathematics of Finance;
- Part B Matrix algebra, linear programming, optimization.

Marking criteria

Marks will be awarded for:

- Your use of Excel, correctness of interpretation of your individual data and ability to explain the decisions you have taken.
- Each group member will be asked to provide peer and self assessment of the input they have provided for the assignment. This is similar to performance assessment in many business environments, particularly in relation to claiming annual bonuses.
- Keeping diary records of the times and dates you were working on the assignment and the tasks you performed will be useful for this purpose.
- The tutor will decide if all members should be awarded the same assignment mark or some proportion of the overall mark on the basis of their input and the group's output.