



**MACQUARIE UNIVERSITY
DIVISION OF EFS**

UNIT OUTLINE

STAT379 Operations Research II

Year and Semester: 2006 Semester 2

Unit convenors: Jenny Middeldorp & Sibba Gudlaugsdottir

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult one of the teaching staff in the unit.

ABOUT THIS UNIT

- Unit Value: Three (3) credit points
- This unit aims to build on students' knowledge in a variety of techniques and solution methods used for optimisation. The techniques require the formulation of problems, logical reasoning and interpretation of results. Integer programming, decision making under uncertainty, game theory, probabilistic inventory and Markov processes are the topics covered. Use is made of a statistical package to analyse data, solve integer programming problems and produce reports.
- Unit rationale: Dealing with uncertainty, using indicator variables in problems, solving and analysis of integer based problems and understanding the use of probabilistic models are an integral part of business decision making. This unit provides the background for making informed decisions about complex problems based on the principle of optimisation.

TEACHING STAFF

- Convenors Jenny Middeldorp E4A 538 Phone 9850 8558
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- Sibba Gudlaugsdottir E4A 516 Phone 9850 8582
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Student should initially direct all their enquiries to Sibba Gudlaugsdottir who is the administrator for this unit.

CLASSES

LECTURES	TUTORIALS	
Wed 18 X5B T1	Wed 16	Thu 17
Thu 19 E7B MASON	Wed 17	Thu 18
Thu 20 E7B MASON	Wed 19	
	Wed 20	

- Students must attend the class to which they have been allocated.
- Attendance at tutorials is compulsory and will be monitored.
Non submission of homework or poor attendance will jeopardise your final grade.

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

- The set material is
Quantitative Decision Making with Spreadsheet Applications by Lapin and Whisler 7th Ed.
Students must purchase the study guides consisting of Lecture overheads.
- Reference books available in the library are as follows:
Operations Research Applications and Algorithms (3d Ed)
by Winston W. L.(PWS Kent)
Operations Research: An Introduction
by H A Taha (Macmillan)

UNIT WEB PAGE

- The web page for this unit is <http://www.stat.mq.edu.au/units/stat379/index.htm>

STUDENT EMAIL ADDRESSES

Students should at all times use their Macquarie University student e-mail addresses when contacting staff. Furthermore, students should check and read their Macquarie University student e-mail on a regular basis.

LEARNING OUTCOMES

The learning outcomes of this unit are outlined at the beginning of each section of the printed notes: However there are some generic outcomes which are listed below.

Students must be able to:

- Formulate problems involving integer and indicator variables
- Use a computer package to solve formulation problems.
- Interpret output and write up conclusions based on the output.
- Solve probabilistic based problems

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop students' generic skills in a range of areas. One of the aims of this unit is that students develop their skills in the following:

Foundation skills of literacy, numeracy and information technology;
Communication skills;
Critical analysis skills;
Problem-solving skills;
Creative thinking skills.

TEACHING AND LEARNING STRATEGY

- Students must attend three lectures each week at which new material is introduced
- Students are expected to have read through the material to be covered using the lecture notes provided in the study guides.
- Students are expected to attend one tutorial class each week for which they have attempted a solution to the homework problems that have been prescribed. They will also solve any new problems presented under the guidance of the tutor. A week-by-week list of the topics to be covered is available at the end of this document.

RELATIONSHIP BETWEEN ASSESSMENT AND LEARNING OUTCOMES

1: Tutorials

Tutorials will commence in week 2 of the semester.

The tutorials are designed as learning exercises. Participation in the tutorials is essential for the understanding of the course content and the ability to solve problems.

Attendance is compulsory and will be monitored. If a student misses more than two tutorial classes he/she may be excluded from the unit, resulting in a fail grade.

Before the tutorial each week, students should prepare the set of homework problems which will have been handed out in the previous week's lecture. During each tutorial the students will work through some further problems.

2: Homework

All homework problems will be handed out in the previous week's lecture.

The homeworks must be handed in to the tutor during the relevant tutorial in the week they are due. Late homeworks will not be accepted.

Each homework task requires you to assimilate the procedures, content and methodology covered during the preceding week and apply them to solving the problems presented. If a student has satisfied all the behavioural objectives for a topic he/she will be able to successfully complete the homework based on that week's topic.

The feedback from the tutor during the tutorial should be used to remediate any part of the subject matter with which the students are having difficulty.

3: Examinations and Test

Class Test

There will be a class test in this unit, worth 10% of the total assessment.

The class test will be held in **week 6** in the lecture on

Thursday 7th of September at 19:00

Students may take into the test **ONE** A4 page of notes written on **ONE** side only.

Failure to attend the test without relevant documentation to explain the absence will result in zero marks being awarded for the test and the possibility of exclusion from the unit. The class test is **compulsory** and there will be **NO** make up tests.

If a student misses the class test he/she must submit relevant documentation or he/she may receive a fail grade for the unit. A valid absence will mean that other coursework marks will be scaled up.

The Class Test covers lecture material from weeks 1-5 inclusive and will be of 50 minutes duration.

Students should bring to the test a calculator, writing implements and a ruler

Marked class test papers will be returned to students during tutorials in week 8.

Solutions to the class test will be summarised in the tutorials in week 8.

Final Examination

The final examination will be held during the end of year exam session. It will be worth 90% of the total assessment and will cover all topics in the unit. Students may take into the final exam **ONE** A4 page of notes written on **BOTH** sides.

NOTE: To obtain a passing grade in the course a **satisfactory performance** will be required **in the final examination** irrespective of any marks gained during the semester. Evidence from your test and tutorial attendance will be used to determine the final grade.

The final examination enables students to display their understanding of each topic and to demonstrate their analytic skills in identifying the statistical methods appropriate to solving problems in a wider context.

The Examination period in second semester commences on 15th November.

Students are expected to present themselves for examination at the time and place designated in the University Examination Timetable. The timetable will be available in **Draft form** approximately eight weeks before the commencement of the examinations and in **Final form** approximately four weeks before the commencement of the examinations. The timetables can be found at:

<http://www.timetables.mq.edu.au/exam>

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. **Special consideration will only be granted to students whose performance in all parts of the coursework is satisfactory.**

Information about unavoidable disruption and the special consideration process is available at

<http://www.reg.mq.edu.au/Forms/APSCons.pdf>

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period.

4: Summary of Assessments

<i>Summary of Assessment</i>	
Class Test	10%
Final Exam	90%

PLAGIARISM

The University defines plagiarism in its rules: "Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. Students must read the University's practices and procedures on plagiarism. These can be found in the *Handbook of Undergraduate Studies* or on the web at:

<http://www.student.mq.edu.au/plagiarism/>

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if a student is found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

UNIVERSITY POLICY ON GRADING

Academic Senate has a set of guidelines on the distribution of grades across the range from fail to high distinction. Your final result will include one of these grades plus a standardised numerical grade (SNG).

On occasion the raw mark for a unit (i.e., the total of your marks for each assessment item) may not be the same as the SNG received. Under the Senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performances of their students should achieve similar results.

It is important that students realise that the policy does not require that a minimum number of students are to be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain their actions if more than 20% of students fail in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark than another will also receive a higher final scaled mark. For an explanation of the policy see

<http://www.mq.edu.au/senate/MQUonly/Issues/Guidelines2003.doc>

or

<http://www.mq.edu.au/senate/MQUonly/Issues/detailedguidelines.doc>.

STUDENT SUPPORT SERVICES

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at

<http://www.student.mq.edu.au>.

Schedule

Week	Commencing	TOPIC	CHAPTER	Homework Due or TEST
1	31 July	Inventory Models	15 + 279 revision	
2	7 August	Inventory Models	16	Homework 1
3	14 August	Inventory Models	16	Homework 2
4	21 August	Markov Process	30 -6 th Ed	Homework 3
5	28 August	Game Theory	28 -6 th Ed	Homework 4
6	4 September	Class test during Thursday lecture. Game Theory during Wednesday lecture.	28 -6 th Ed	Class Test during lecture. No homework due this week, however, there will be tutorials.
7	11 September	Integer Programming	11.1+ Lecture Notes	Homework 5
Semester Break 16th September – 2nd October				
8	3 October	Integer Programming	11.1+ Lecture Notes	Go over Class Test during tutorial. No homework due this week.
9	9 October	Integer Programming	11.1 + Lecture Notes	Homework 6
10	16 October	Decision Making	6 + Lecture Notes	Homework 7
11	23 October	Decision Making	6 + Lecture Notes	Homework 8
12	30 October	Decision Making	5+ Lecture Notes	Homework 9
13	6 November	Review		No homework due this week, however, there will be tutorials.