



MONASH University

**FIT4022**  
**Computer models for business decisions**

**Unit Guide**

**Semester 2, 2009**

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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# **FIT4022 Computer models for business decisions - Semester 2, 2009**

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## Introduction

Welcome to FIT4022 Computer Models for Business Decisions for semester 2, 2009. This 6 point unit is an elective unit of Master of Business Systems offered by the Faculty of IT. Built upon the foundation units offered in the undergraduate courses of FIT or other faculty, this unit provides advanced concept and techniques for information processing, particularly useful for business environment.

Specifically, the unit introduces a number of common math models used by business managers in making business decisions. It explores many aspects of decision making process with emphasis on the relationship between theoretical knowledge and its practical application using cases and real examples. Computer solutions or simulations are provided to implement the theoretic and practical concepts.

## Unit synopsis

This unit examines the principles and practice of modelling and analysis of business systems as a support for the decision making activities. At the completion of the subject the student should understand some of the most commonly used computer modelling techniques used in business and industry and be familiar with the applications of these techniques to business related problems. Topics will include breakeven analysis, linear programming models, various aspects of decision making, waiting lines systems and simulation, network problems, and forecasting techniques.

## Learning outcomes

Students will have understanding of:

1. Principles and application of computer based business and decision support systems
2. Cost analysis using breakeven technique
3. Main approaches to deal with decision making problems in business
4. Business decisions with multiple criteria
5. Widely used linear programming tools
6. Carrying out sensitivity analysis using relevant computer software on a series of problems
7. Queuing theory and simulation techniques
8. Concepts of different types of forecasting
9. Common optimisation methods for business applications
10. Methodology to solve typical network problems using network flow models
11. Efficiency and productivity gains through the use of technologies
12. Develop strong interests in formalising real world problems and solve them by computer models
13. Application of spreadsheets such as EXCEL in solving common business decision problems
14. Use of dedicated software such as Excel QM, TreePlan, CrystalBall program
15. Sensitivity analysis by use of computer models
16. Meet peer students and professionals with variety of business expertise
17. Participate in group discussion and team work solutions to business problems

## Contact hours

This unit has no on campus requirements

## **Workload**

For on campus students, workload commitments are:

- two-hour lecture and
- two-hour tutorial (lab based, advance preparation is required)
- a minimum of 2 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.
- You will need to allocate up to 5 hours per week, for use of a computer, including time for newsgroups/discussion groups.

Off-campus students generally do not attend lecture and tutorial sessions, however, you **MUST** spend equivalent time working through the relevant resources and participating in discussion groups each week.

## **Unit relationships**

### **Prohibitions**

BUS5570, BUS4570, GCO4802

### **Relationships**

FIT4022 is an elective unit of Master of Business Systems. .

You may not study this unit and BUS5570, BUS4570, GCO4802 in your degree.

## Teaching and learning method

The approach to teaching and learning include a weekly two-hour lecture and a two-hour tutorial. Additionally, each student should spend a minimum of 8 hours for personal study every week and should allocate up to 5 hours per week for use of a computer, including time for newsgroup access and discussion.

## Timetable information

For information on timetabling for on-campus classes please refer to MUTTS, <http://mutts.monash.edu.au/MUTTS/>

## Tutorial allocation

On-campus students should register for tutorials/laboratories using the Allocate+ system:  
<http://allocate.cc.monash.edu.au/>

## Unit Schedule

Week	Topic	Study guide	References/Readings	Key dates
1	Introduction and Breakeven Analysis	SG1	Chapter 1 of text book	
2	Linear Programming	SG2	Chapter 2 of text book	
3	Linear Programming: Computer Solution and Sensitivity Analysis	SG3	Chapter 3&4 of text book	
4	Integer Programming	SG4	Chapter 5 of text book	
5	Transportation and Assignment Problems	SG5	Chapter 6 of text book	
6	Shortest Path and Minimal Spanning Tree Problems	SG6	Chapter 7 of text book	Assignment 1 Due
7	Multicriteria Decision Making	SG7	Chapter 9 of text book	
8	Decision Making Theory	SG8	Chapter 11, 12 of text book.	
9	Decision Tree	SG9	Chapter 11, 12 of text book.	
10	Queuing Analysis	SG10	Chapter 13 of text book.	
Mid semester break				
11	Monte Carlo Simulation	SG11	Chapter 14 of text book.	Assignment 2 Due
12	Forecasting	SG12	Chapter 15 of text book.	
13	Exam Preparation	SG1-12	All related chapters of the text book	

## Unit Resources

### Prescribed text(s) and readings

Taylor, B.W. III, Introduction to Management Science, 9th edition, Prentice Hall, 2007, ISBN: 0-13-196133-0.

[http://www.pearsonhighered.com/educator/academic/product/0,,0131888099-IS,00%2ben-USS\\_01DBC.html](http://www.pearsonhighered.com/educator/academic/product/0,,0131888099-IS,00%2ben-USS_01DBC.html)

Text books are available from the Monash University Book Shops. Availability from other suppliers cannot be assured. The Bookshop orders texts in specifically for this unit. You are advised to purchase your text book early.

### Recommended text(s) and readings

1. D. R. Anderson, D. J. Sweeney and T. A. Williams, An Introduction to Management Science, Thomson Learning, 2005.
2. W. L. Winston, S. C. Albright and M. Broadie, Practical Management Science, 2nd edition, Dusbury, 2001.
3. J. A. Lawrence Jr. and B. A. Pasternack, Applied Management Science, John Wiley & Sons Inc. 1998.
4. B. Render, R. M. Stair Jr, Nagraj Balakrishnan, Managerial Decision Modeling with Spreadsheets, Prentice Hall, 2003.

### Required software and/or hardware

The three Excel based software packages: Excel QM, Crystal Ball and TreePlan are included in the prescribed text book.

### Equipment and consumables required or provided

Students studying off-campus are required to have the minimum system configuration specified by the Faculty as a condition of accepting admission, and regular Internet access. On-campus students, and those studying at supported study locations may use the facilities available in the computing labs. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook. You will need to allocate up to 5 hours per week for use of a computer, including time for newsgroups/discussion groups.

### Study resources

Study resources we will provide for your study are:

- A printed Unit Book containing 12 Study Guides, sent from CeLTS
- This Unit Information outlining the administrative information for the unit
- A CD-ROM bundled with the prescribed text book providing the required software for this unit
- The FIT4022 web site on MUSO, where lecture slides, weekly tutorial requirements, assignment specifications and sample solutions will be posted
- Newsgroups that can be linked to from the Unit Homepage

## Assessment

### Overview

Assignments: 30%

Examination: 70%

### Faculty assessment policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 44% then a mark of no greater than 44-N will be recorded for the unit.

Final grade (%) =  $\min(A, E, E * R + A * (1 - R))$

Where A = Overall assignment percentage

E = Examination percentage

R = Exam weighting (0.7)

### Assignment tasks

#### Assignment coversheets

Assignment coversheets are available via "Student Forms" on the Faculty website:

<http://www.infotech.monash.edu.au/resources/student/forms/>

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

**Assignment submission and return procedures, and assessment criteria will be specified with each assignment.**

#### • Assignment task 1

**Title:**

Assignment 1

**Description:**

Assessment of SG1-6.

**Weighting:**

15%

**Due date:**

Week 6



- **Assignment task 2**

**Title:**

Assignment 2

**Description:**

Assessment of SG7-12.

**Weighting:**

15%

**Due date:**

Week 11

## Examination

- **Weighting:** 70%

**Length:** 3 hours

**Type (open/closed book):** Open book

**Remarks:**

Only the prescribed text book is allowed to be taken into the exam.

**See Appendix for End of semester special consideration / deferred exams process.**

## Due dates and extensions

Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are not regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students requesting an extension for any assessment during semester (eg. Assignments, tests or presentations) are required to submit a Special Consideration application form (in-semester exam/assessment task), along with original copies of supporting documentation, directly to their lecturer within two working days before the assessment submission deadline. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

A copy of the email or other written communication of an extension must be attached to the assignment submission.

Refer to the Faculty Special consideration webpage or further details and to access application forms:

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>

## Late assignment

Assignments received after the due date will be subject to a penalty of 5% per day, including weekends. Assignments received later than one week (seven days) after the due date will not normally be accepted. In some cases, this period may be shorter if there is a need to release sample solutions.

This policy is strict because comments or guidance will be given on assignments as they are returned, and sample solutions may also be published and distributed, after assignment marking or with the returned assignment.

## **Return dates**

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

## Appendix

Please visit the following URL: <http://www.infotech.monash.edu.au/units/appendix.html> for further information about:

- Continuous improvement
- Unit evaluations
- Communication, participation and feedback
- Library access
- Monash University Studies Online (MUSO)
- Plagiarism, cheating and collusion
- Register of counselling about plagiarism
- Non-discriminatory language
- Students with disability
- End of semester special consideration / deferred exams