

**FIT4022**  
**Computer Models for Business Decisions**

**Unit guide**

**Semester 2, 2008**

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# **FIT4022 Computer Models for Business Decisions - Semester 2 , 2008**

## **Unit leader :**

Dengsheng Zhang

## **Lecturer(s) :**

### **Gippsland**

- Dengsheng Zhang

## Introduction

Welcome to FIT4022 Computer Models for Business Decisions for semester 2, 2008. 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. Topics to be studied will include

- Cost and profit analysis using breakeven technique
- Common optimisation methods in business applications, such as linear programming and integer programming
- Sensitivity analysis of linear programming using computer solutions
- Solutions to traditional business problems, such as transportation, assignment and shortest path problems, using computer models
- Various aspects of decision making such as decision making under risk, under uncertainty, decision with sample information
- Multiple goals and multiple parties decision making
- Waiting lines systems and simulation including Monte Carlo simulation
- Forecasting techniques namely exponential smoothing and regression.
- Using PC based software to solve problems in the various topics. Most of the models have been developed using Microsoft EXCEL but would be equally applicable to any spreadsheet package.

## Learning outcomes

In this unit students will study the principles and application of computer based business and decision support models. This unit enables students to become conversant with the operation and computer application of the nominated business models, and to carry out sensitivity analyses using the relevant computer software on a series of problems.

At the completion of the subject, students should understand some of the more commonly used computer modelling techniques used in business and industry and be able to apply these techniques to business related problems using Excel based application software and other related tools. Students will be able to make sensible decisions based on the computer solutions and sensitivity analysis.

## 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**

### **Prerequisites**

Students must meet the entry requirements of the Master of Business Systems or equivalent.

You should have knowledge of fundamental algebra and statistics methods.

### **Relationships**

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

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

## Continuous improvement

Monash is committed to 'Excellence in education' and strives for the highest possible quality in teaching and learning. To monitor how successful we are in providing quality teaching and learning Monash regularly seeks feedback from students, employers and staff. Two of the formal ways that you are invited to provide feedback are through Unit Evaluations and through Monquest Teaching Evaluations.

One of the key formal ways students have to provide feedback is through Unit Evaluation Surveys. It is Monash policy for every unit offered to be evaluated each year. Students are strongly encouraged to complete the surveys as they are an important avenue for students to "have their say". The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

## Student Evaluations

The Faculty of IT administers the Unit Evaluation surveys online through the my.monash portal, although for some smaller classes there may be alternative evaluations conducted in class.

If you wish to view how previous students rated this unit, please go to <http://www.monash.edu.au/unit-evaluation-reports/>

Over the past few years the Faculty of Information Technology has made a number of improvements to its courses as a result of unit evaluation feedback. Some of these include systematic analysis and planning of unit improvements, and consistent assignment return guidelines.

Monquest Teaching Evaluation surveys may be used by some of your academic staff this semester. They are administered by the Centre for Higher Education Quality (CHEQ) and may be completed in class with a facilitator or on-line through the my.monash portal. The data provided to lecturers is completely anonymous. Monquest surveys provide academic staff with evidence of the effectiveness of their teaching and identify areas for improvement. Individual Monquest reports are confidential, however, you can see the summary results of Monquest evaluations for 2006 at <http://www.adm.monash.edu.au/cheq/evaluations/monquest/profiles/index.html>

## Improvements to this unit

A new unit book consisting of 12 study guides has been created, it replaces the previous version of 7 study guides.

## **Unit staff - contact details**

### **Unit leader**

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## 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.

## Communication, participation and feedback

Monash aims to provide a learning environment in which students receive a range of ongoing feedback throughout their studies. You will receive feedback on your work and progress in this unit. This may take the form of group feedback, individual feedback, peer feedback, self-comparison, verbal and written feedback, discussions (on line and in class) as well as more formal feedback related to assignment marks and grades. You are encouraged to draw on a variety of feedback to enhance your learning.

It is essential that you take action immediately if you realise that you have a problem that is affecting your study. Semesters are short, so we can help you best if you let us know as soon as problems arise. Regardless of whether the problem is related directly to your progress in the unit, if it is likely to interfere with your progress you should discuss it with your lecturer or a Community Service counsellor as soon as possible.

## 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		



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			Chapter 11, 12 of text book.	
10	Queuing Analysis	SG10	Chapter 13 of text book.	
11	Monte Carlo Simulation	SG11	Chapter 14 of text book.	Assignment 2 Due
Mid semester break				
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.

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

### Library access

The Monash University Library site contains details about borrowing rights and catalogue searching. To learn more about the library and the various resources available, please go to <http://www.lib.monash.edu.au>. Be sure to obtain a copy of the Library Guide, and if necessary, the instructions for remote access from the library website.

## Monash University Studies Online (MUSO)

All unit and lecture materials are available through MUSO (Monash University Studies Online). Blackboard is the primary application used to deliver your unit resources. Some units will be piloted in Moodle. If your unit is piloted in Moodle, you will see a link from your Blackboard unit to Moodle (<http://moodle.monash.edu.au>) and can bookmark this link to access directly. In Moodle, from the Faculty of Information Technology category, click on the link for your unit.

You can access MUSO and Blackboard via the portal: <http://my.monash.edu.au>

Click on the Study and enrolment tab, then Blackboard under the MUSO learning systems.

In order for your Blackboard unit(s) to function correctly, your computer needs to be correctly configured.

For example:

- Blackboard supported browser
- Supported Java runtime environment

For more information, please visit: <http://www.monash.edu.au/muso/support/students/downloadables-student.html>

**You can contact the MUSO Support by: Phone: (+61 3) 9903 1268**

For further contact information including operational hours, please visit:  
<http://www.monash.edu.au/muso/support/students/contact.html>

Further information can be obtained from the MUSO support site:  
<http://www.monash.edu.au/muso/support/index.html>

## Assessment

### Unit assessment policy

The unit is assessed with two assignments (30%) and a three hour open book examination (70%). To pass the unit you must:

- attempt both the assignments and the examination
- achieve an average of no less than 40% for the two assignments
- achieve no less than 40% of the possible marks in the exam
- achieve no less than 50% of overall marks 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)

Thus to pass the unit you must perform satisfactorily in both the assignment and the examination with a final grade of 50% or more.

### Assignment tasks

#### • Assignment Task

**Title :** Assignment 1

**Description :**

Assessment of SG1-6.

**Weighting :** 15%

**Criteria for assessment :**

Score a minimum of 50% on solving the nominated business problems.

**Due date :** 22 August 2008

#### • Assignment Task

**Title :** Assignment 2

**Description :**

Assessment of SG7-12.

**Weighting :** 15%

**Criteria for assessment :**

Score a minimum of 50% on solving the nominated business problems.

**Due date :** 26 September 2008

## **Examinations**

- **Examination**

**Weighting :** 70%

**Length :** 3 hours

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

**Remarks ( optional - leave blank for none ) :**

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

## **Assignment submission**

Assignments **MUST** be submitted electronically through Webface:

<http://wfsubmit.its.monash.edu.au/>

## University and Faculty policy on assessment

### Due dates and extensions

The due dates for the submission of assignments are given in the previous section. 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 seldom regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

### 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.

Assessment for the unit as a whole is in accordance with the provisions of the Monash University Education Policy at <http://www.policy.monash.edu/policy-bank/academic/education/assessment/>

We will aim to have assignment results made available to you within two weeks after assignment receipt.

### Plagiarism, cheating and collusion

Plagiarism and cheating are regarded as very serious offences. In cases where cheating has been confirmed, students have been severely penalised, from losing all marks for an assignment, to facing disciplinary action at the Faculty level. While we would wish that all our students adhere to sound ethical conduct and honesty, I will ask you to acquaint yourself with Student Rights and Responsibilities (<http://www.infotech.monash.edu.au/about/committees-groups/facboard/policies/studrights.html>) and the Faculty regulations that apply to students detected cheating as these will be applied in all detected cases.

In this University, cheating means seeking to obtain an unfair advantage in any examination or any other written or practical work to be submitted or completed by a student for assessment. It includes the use, or attempted use, of any means to gain an unfair advantage for any assessable work in the unit, where the means is contrary to the instructions for such work.

When you submit an individual assessment item, such as a program, a report, an essay, assignment or other piece of work, under your name you are understood to be stating that this is your own work. If a submission is identical with, or similar to, someone else's work, an assumption of cheating may arise. If you are planning on working with another student, it is acceptable to undertake research together, and discuss problems, but it is not acceptable to jointly develop or share solutions unless this is specified by your lecturer.

Intentionally providing students with your solutions to assignments is classified as "assisting to cheat" and students who do this may be subject to disciplinary action. You should take reasonable care that your solution is not accidentally or deliberately obtained by other students. For example, do not leave copies of your work in progress

on the hard drives of shared computers, and do not show your work to other students. If you believe this may have happened, please be sure to contact your lecturer as soon as possible.

Cheating also includes taking into an examination any material contrary to the regulations, including any bilingual dictionary, whether or not with the intention of using it to obtain an advantage.

Plagiarism involves the false representation of another person's ideas, or findings, as your own by either copying material or paraphrasing without citing sources. It is both professional and ethical to reference clearly the ideas and information that you have used from another writer. If the source is not identified, then you have plagiarised work of the other author. Plagiarism is a form of dishonesty that is insulting to the reader and grossly unfair to your student colleagues.

## **Register of counselling about plagiarism**

The university requires faculties to keep a simple and confidential register to record counselling to students about plagiarism (e.g. warnings). The register is accessible to Associate Deans Teaching (or nominees) and, where requested, students concerned have access to their own details in the register. The register is to serve as a record of counselling about the nature of plagiarism, not as a record of allegations; and no provision of appeals in relation to the register is necessary or applicable.

## **Non-discriminatory language**

The Faculty of Information Technology is committed to the use of non-discriminatory language in all forms of communication. Discriminatory language is that which refers in abusive terms to gender, race, age, sexual orientation, citizenship or nationality, ethnic or language background, physical or mental ability, or political or religious views, or which stereotypes groups in an adverse manner. This is not meant to preclude or inhibit legitimate academic debate on any issue; however, the language used in such debate should be non-discriminatory and sensitive to these matters. It is important to avoid the use of discriminatory language in your communications and written work. The most common form of discriminatory language in academic work tends to be in the area of gender inclusiveness. You are, therefore, requested to check for this and to ensure your work and communications are non-discriminatory in all respects.

## **Students with disabilities**

Students with disabilities that may disadvantage them in assessment should seek advice from one of the following before completing assessment tasks and examinations:

- Faculty of Information Technology Student Service staff, and / or
- your Unit Coordinator, or
- Disabilities Liaison Unit

## **Deferred assessment and special consideration**

Deferred assessment (not to be confused with an extension for submission of an assignment) may be granted in cases of extenuating personal circumstances such as serious personal illness or bereavement. Information and forms for Special Consideration and deferred assessment applications are available at <http://www.monash.edu.au/exams/special-consideration.html>. Contact the Faculty's Student Services staff at your campus for further information and advice.