

620-362
Applied Operations Research

Course Outline and Administration

Department of Mathematics and Statistics
The University of Melbourne

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Some contents of this presentation are adapted from year 2007 lecture notes for 620-362 Applied Operations Research, Department of Mathematics and Statistics, The University of Melbourne (by A/Prof Moshe Sniedovich), and from year 2005 course notes for 620-362 Applied Operations Research, Department of Mathematics and Statistics, The University of Melbourne (compiled by Prof Natasha Boland and Dr Renata Sotirov)

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620-362 Applied OR

- Lecturers:
 - Heng-Soon Gan
 - Teaching weeks 1-8, 11 & 12
 - Room 139, h.gan@ms.unimelb.edu.au
 - Office hours: Tuesday, Wednesday, Friday 2-3pm
 - Olivia Smith
 - Teaching weeks 9 & 10
 - Room 143, omadill@ms.unimelb.edu.au (by appointment)
- Prerequisites: 620-361 or 620-262
 - Also recommended is 620-131 or Computer Science 433-152, 433-172
- Format:
 - 36 lectures
 - three per week
 - 12 practice classes
 - one per week, 4:15-5:10pm Tuesday
 - 12 (un)supervised lab sessions
 - one per week, 4:15-5:15pm Friday, Wilson Lab

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Course Content

- Modelling linear, non-linear and mixed integer mathematical programming problems
- Modelling and solving problems using Xpress^{MP}
- Network optimization models and optimization
- The branch-and-bound algorithm for combinatorial optimization and integer programming
- Advanced integer programming: preprocessing, cutting planes and column generation
- Heuristics and metaheuristics for combinatorial optimization

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Course objectives

- To comprehend
 - mathematical programming models and algorithms for solving **real-world research problems**
 - the principles of effective problem formulation
- To develop your ability to
 - formulate effective models for real-world OR problems
 - implement formulations using a computer based modelling language
 - apply standard algorithms
 - develop new algorithms
- To appreciate the
 - role of OR techniques in decision support
 - scope and limitations of OR methods
 - issues that arise when applying OR techniques to real-world problems

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Courseware

- Lecture slides
 - Can be downloaded from subject website
- Handouts
 - Lecture support material
- Practice sheets
 - Practice class support material
- Operations Research: Applications and Algorithms (Wayne L. Winston, 4th Edition)
 - MS library
- Xpress-IVE
 - Sample Xpress-IVE models
 - Student version (Wilson Lab): assignments
 - Full version (Wilson Lab): team project

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Assessment

- **Assignments**
 - Assignment work is to be done **individually**.
 - Any collaborations will be **dealt with severely**.
 - One Xpress^{MP} assignment (Assignment 1)
 - 15% of overall course mark
 - given: 12th August 08; due: 10th October 08
 - Two regular assignments (Assignment 1 & Assignment 2)
 - 10% **each** of overall course mark
 - 26th August 08 (due 12th September 08) and 17th October 08 (due 31st October 08)
- **Submissions:**
 - by due date: max. 100%
 - (due date, due date + 7 days): max. 50%
 - after due date + 7 days: max. 0%

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Assessment (cont'd)

- **Mid-semester test (90 minutes)**
 - 25% of overall course mark
 - 7th October 2008 (3:20 – 5:00pm), 10-minute reading time
 - No supplementary test
- **One team project**
 - 40% of overall course mark
 - **Real industrial client**

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Team Project - General

- **A real industrial project, with a real client**
- **Teams: 4-5 persons per team**
 - Presentation: Week 12
 - Report due 7th November 08
- **Assessment**
 - Content
 - Report
 - Presentation
- **Generic skills lecture:**
 - Effective presentation
 - Report writing

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Course highlights

- **1st August 08:** A briefing session by industrial client
- **15th August 08:** Team project proposal due
- **15th August 08:** Supervised Xpress^{MP} lab (4:15-5:15)
- **19th August 08:** Team project proposal feedback
- **26th August 08:** Revised team project proposal due
- **12th September 08:** Assignment 2 due
- **17th September 08:** Report writing workshop
- **19th September 08:** Presentation workshop
- **7th October 08:** Mid-semester test
- **14th October 08:** Assignment 1 due
- **28th October 08 till 31st October 08:** Presentation
- **31st October 08:** Assignment 3 due
- **7th November 08:** Team project report due

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Student Representative (SSLC)

- Pizza!!
- Two meetings
- Questionnaire

We need a volunteer...

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Other important business...

- Plagiarism forms
 - fill one for this course (submit one with 1st assignment)
- Printing arrangements
 - from G65
 - purchase printing card from the General Office for \$10.50
- Special consideration
- Academic misconduct
- Vacation scholarships for undergraduates
- Beyond third year...
 - postgraduate study scholarships