Bus O711: Operations Analysis Under Uncertainty[1]
FALL 2011 Course Outline

(Supply Chain Management Specialization/Minor)

Dr. Mahmut Parlar
Operations Management Area

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1 COURSE OBJECTIVE

This course, in conjunction with Bus O710, is intended to provide knowledge of the basic problem solving techniques of management science when a decision maker is faced with uncertainty. Such knowledge is useful not only in actual applications but also as a "language proficiency" that will assist the student in understanding research and advanced methods in supply chain management and other disciplines of business administration including finance, accounting and marketing.

2 PREREQUISITES

- Bus Q600: Applied Business Statistics (or, equivalent).
- Familiarity with the Excel spreadsheet is expected as we will be using Excel add-ins that are included with the text, i.e., TreePlan, RiskSim and SensIt.

3 SECTIONS

Section	O711-EC01
Time	Mon: 19:00–22:00
Class location	RJC 263

[1] This is one of the required courses for the Supply Chain Management Specialization/Minor but the students specializing in Finance may also benefit from learning some of the topics that will be covered (such as probability, decision analysis and utility theory, simulation and dynamic programming).

4 INSTRUCTOR and CONTACT INFORMATION

4.1 Instructor

Dr. Mahmut Parlar

parlar@mcmaster.ca

Office: DSB-425 & RJC-221

Office hours: TBA

(905) 525-9140, Ext. 22858

http://www.business.mcmaster.ca/OM/parlar/

4.2 Teaching Assistants

Name	Email	Phone	Office
Behrouz Bakhtiari	bakhtib@mcmaster.ca	x27440	TBA

5 Course Website

http://www.business.mcmaster.ca/courses/O711/

6 COURSE ELEMENTS

Credit Value:	3	Team Skills:	No	IT Skills:	Yes	Global:	Yes
WebCT:	No	Verbal Skills:	No	Numeracy:	Yes	Political:	No
Participation:	No	Written Skills:	Yes	Innovation:	Yes	Social:	No

7 COURSE DESCRIPTION

The course will focus on studying the most frequently used probabilistic management science techniques which deal with decisions under conditions of uncertainty. Use of the Excel spreadsheet will be required (along with TreePlan and RiskSim) to solve realistic decision problems. Class time will be used to exemplify and elaborate on particular parts of the textbook.

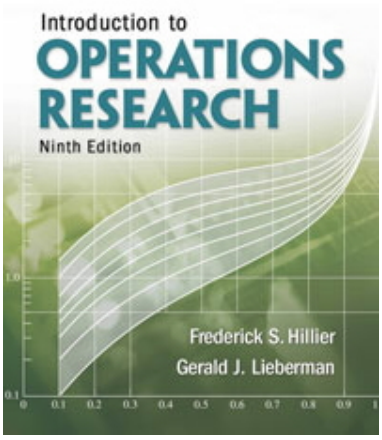
8 LEARNING OUTCOMES

Upon completion of this course, students will be able to complete the following tasks:

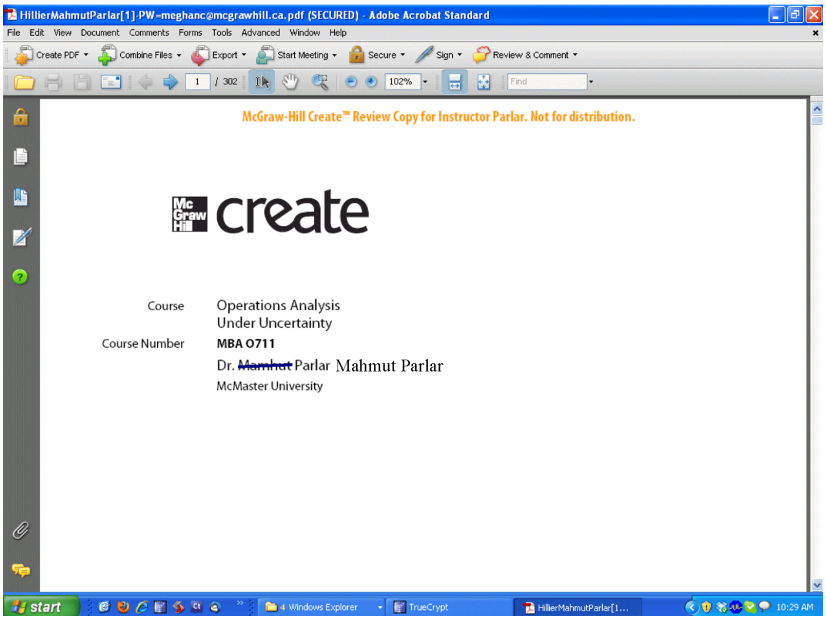
- Analyze descriptive and design-related problems arising in queuing (Chapter 17);
- Simulate complex problems using Excel and the add-ins (Chapter 20);
- Analyze decision problems that must be made over time and where uncertainty plays an important role by using decision trees and dynamic programming (Chapters 15 and 10).

9 REQUIRED COURSE MATERIALS and READINGS

- *Introduction to Operations Research*, 9th edition, by F. S. Hillier and G. J. Lieberman.



- We will be using only Chapters 1, 2, 10, 15, 17 and 20 of this text. A custom-designed book will be available in the bookstore for a substantially discounted price. The custom book will come with a Premium Access Card which the students can use to access the premium content (including TreePlan, RiskSim and SensIt add-ins for Excel, online appendices, links to other sites, etc.) on book's website `http://highered.mcgraw-hill.com/sites/0073376299/information_center_view0/`.



- To purchase the Access Card, you could also visit Student Edition of the Online Learning Centre and purchase this online.

`http://highered.mcgraw-hill.com/sites/0073376299/student_view0/index.html`

- From this site, when you choose content that requires 'Premium Access' you will be prompted to log in with your access code or you can choose 'Purchase Online'.

10 EVALUATION

- Regular assignments will be given and graded.
- Each student must prepare a report on an application of one of the topics (i.e., probability, queueing, simulation, dynamic programming, or decision analysis) that will be covered in this course.
  - The report could be a review of a published paper describing the application. (For examples of such publications, see the INFORMS ARTICLES link under Course-wide Content on book's website.) Alternatively, it could be based on a "real-life" use of the technique the student implemented in his/her work or daily life.
  - The report should be between 5 to 10 *typewritten* (i.e., wordprocessor-prepared) pages. Due date is **December 9, 2011, Friday, 12:00 noon**.
  - **Students should get the approval of the instructor on the topic chosen before embarking on this project**.
- There will be a mid-term examination and a final examination.

10.1 Components and Weights

The components of the course grade will be weighted as follows.[2]

Component	Weight
Marked Assignments	15%
Project	15%
Mid-term Examination	30%
Final	40%
TOTAL	100%

Note: The use of a calculator is allowed during examinations in this course.

10.2 Conversion

At the end of the course your overall percentage grade will be converted to your letter grade in accordance with the following conversion scheme.

[2] Any requests for a re-read of the assignments or examinations should be made within two weeks of the date of distribution of the marks.

Letter Grade	Percent	Letter Grade	Percent
A+	90–100	B−	65–69
A	85–89	C+	60–64
A−	80–84	C	55–59
B+	75–79	C−	50–54
B	70–74	F	0–49

10.3 Communication and Feedback

Students that are uncomfortable in directly approaching an instructor regarding a course concern may choose to send a confidential and anonymous email to the respective Area Chair at:

`http://www.degroote.mcmaster.ca/curr/emailchairs.aspx`

Students who wish to correspond with instructors directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and sensitivity of information as well as confirms the identity of the student.

Instructors should conduct an informal course review with students by Week #4 to allow time for modifications in curriculum delivery. Instructors should provide evaluation feedback for at least 10% of the final grade to students prior to Week #8 in the term.

11 ACADEMIC DISHONESTY

It is the student's responsibility to understand what constitutes academic dishonesty. Please refer to the University Senate Academic Integrity Policy at the following URL:

`http://www.mcmaster.ca/univsec/policy/AcademicIntegrity.pdf`

This policy describes the responsibilities, procedures, and guidelines for students and faculty should a case of academic dishonesty arise. Academic dishonesty is defined as to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. Please refer to the policy for a list of examples. The policy also provides faculty with procedures to follow in cases of academic dishonesty as well as general guidelines for penalties. For further information related to the policy, please refer to the Office of Academic Integrity at:

`http://www.mcmaster.ca/academicintegrity`

12 COPYRIGHT

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as long as the purpose for the material is private study, and that the total amount copied equals **NO MORE THAN 10 percent** of a work or an entire chapter which is less than 20 percent of a work. In other words, it is illegal to: i) copy an entire book, or ii) repeatedly copy smaller sections of a publication that cumulatively cover over 10 percent of the total work's content. Please refer to the following copyright guide for further information:

`http://library.mcmaster.ca/about/copying.pdf`

13 MISSED EXAMINATIONS / TESTS / CLASS PARTICIPATION

When students miss a regularly scheduled midterm, test or class participation for legitimate reasons as adjudicated by the MBA Academic Services Office, the weight for that midterm/test/participation will be distributed across other evaluative components of the course at the discretion of the instructor. Documentation explaining such an absence must be provided to the MBA Academic Services Office within five (5) working days upon returning to school.

To document absences for health related reasons, please provide the Petition for Relief for MBA Missed Term Work and the McMaster University Student Health Certificate, which can be found on the DeGroote website at:

`http://www.degroote.mcmaster.ca/MBA/registration.html`

University policy states that a student may submit a maximum of three (3) medical certificates per year after which the student must meet with the Director of the program.

To document absences for reasons other than health related, please provide documentation supporting the reason for the absence and the Petition for Relief for MBA Missed Term Work:

`http://www.degroote.mcmaster.ca/MBA/documents/relief.pdf`

Students unable to write a midterm at the posted exam time due to the following reasons: religious; work-related (for part-time students only); representing university at an academic or varsity athletic event; conflicts between two overlapping scheduled midterm exams; or other extenuating circumstances, have the option of applying for special exam arrangements. Such requests must be made to the MBA Academic Services Office at least ten (10) working days before the scheduled exam along with acceptable documentation. Instructors cannot themselves allow students to unofficially write make-up exams/tests. Adjudication of the request must be handled by the MBA Academic Services Office.

All applications for deferred and special final examination arrangements must be made to the MBA Academic Services Office. Failure to meet the stated deadlines may result in the denial of these arrangements. Deferred examination privileges, if granted, must be satisfied during the examination

period at the end of the term immediately following. There will be one common sitting for all deferred exams. Please refer to the MBA Calendar for further details.

If any exam is missed without a valid reason, students will receive a grade of Zero (0) for that component.

14 STUDENTS WITH DISABILITIES

Students with disabilities are required to inform the Centre for Student Development (CSD) of accommodation needs for examinations on or before the last date for withdrawal from a course without failure (please refer to official university sessional dates). Students must forward a copy of such CSD accommodation to the instructor immediately upon receipt. If a student with a disability chooses NOT to take advantage of a CSD accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. The CSD website is:

`http://csd.mcmaster.ca`

15 POTENTIAL MODIFICATIONS TO THE COURSE

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

16 PLACES YOU GET HELP WITH YOUR WORK

Teaching assistants will be available to help students in regularly scheduled office hours (TBA). In addition to this, the instructors will be available to answer questions **during office hours** (TBA).

17 COURSE SCHEDULE

Chapter 24: Review of Probability (in the *Online Appendix*) (2 weeks)

- Since the MBA students are already familiar with probability (as presented in Q600), we will have a very brief review of basic rules of probability, conditional probability, Bayes' rule and random variables.

Chapter 17: Queuing Theory (4 weeks)

- Queueing terminology, arrival and service processes, exponential distribution, birth-and-death processes, queueing models based on exponential and non-exponential distributions, priority queues, queueing networks, optimal number of servers to choose, applications.

★ **Midterm Examination (November 11, 2011, Friday, 19:00-21:00)** — *Date Tentative*

Chapter 20: Simulation (2 weeks)

- What is simulation?, random numbers, using spreadsheets to perform simulations, applications.

Chapter 15: Decision Analysis (2 weeks)

- Decision making without and with experimentation, decision trees, using spreadsheets to sensitivity analysis on decision trees, utility theory, applications.

Chapter 10: Dynamic Programming (2 weeks)

- The "stagecoach" problem, deterministic and probabilistic dynamic programming, applications.

18 CLASSROOM CONDUCT

Please respect the following line of conduct in class in order to preserve a favorable learning environment:

- Show up to class on time.
- Phones and beepers turned off; no leaving class for calls.
- No talking while the instructor is talking.
- Questions to be directed to the instructor.
- No reading materials unrelated to class.

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