MBA O701
Modelling and Analytics Using Spreadsheets
Fall 2020 Course Outline

Operations Management Area
DeGroote School of Business
McMaster University

COURSE OBJECTIVE

To gain familiarity with the fundamental concepts, assumptions, and limitations behind the most common prescriptive analytics techniques, and see how each works. Spreadsheets have become one of the most widely used analytical tools in the hands of managers, and hence this course will provide an application-oriented introduction to building computer models for solving business problems. To that end, a variety of real-world managerial problems would be logically modeled, solved and analyzed using *Analytic Solver Platform*, an Excel add-in.

INSTRUCTOR AND CONTACT INFORMATION

	Section 01	Section 02
Day and Time	Wednesdays 2:30pm to 5:20pm	Fridays 11:30am to 2:30pm
Venue	Zoom	Zoom
Teaching Assistant	Mohammad S. Moshtagh	Nishit Bhavsar
	moshtam@mcmaster.ca	bhavsn1@mcmaster.ca
Instructor	Dr. Manish Verma	
	mverma@mcmaster.ca	
	DSB415; Tel.: (905) 525-9140 #27438	
Office Hours	Wednesdays 1:15pm to 2:15pm	Fridays 10:15am to 11:15am
	Or, by appointment	

Course Website: http://www.business.mcmaster.ca/courses/O701/

COURSE ELEMENTS

Avenue:	Yes	Leadership:	No	IT skills:	Yes	Global view:	Yes
Participation:	No	Ethics:	Yes	Numeracy:	Yes	Written skills:	Yes
Evidence-based:	No	Innovation:	Yes	Group work:	Yes	Oral skills:	Yes
Experiential:	Yes	Guest speaker(s):	No	Final Exam:	Yes		

COURSE DESCRIPTION

Management Science, a scientific approach to aid managerial decision-making, is regularly used by major corporations such as Air Canada, IBM, Canadian Pacific, etc., to help solve complex problems. This course will discuss the most popular prescriptive analytics techniques, and then use them to logically model real-world applications from a variety of business areas such as operations, marketing, finance, etc., The logical model will be converted into a computer model, which will then be solved and analyzed via *Analytic Solver Platform* (within a spreadsheet environment).

LEARNING OUTCOMES

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

- Use management science techniques to solve managerial problems.
- Logically model, solve, and analyze a problem in Analytics Solver Platform (& Excel).
- Simulate (components of) a decision problem.
- Apply modeling and analytical techniques to larger problem settings (i.e., real-world applications).

REQUIRED COURSE MATERIALS AND READINGS

Custom textbook developed with Wiley entitled, "*O701: Modeling and Analytics Using Spreadsheets*". ISBN: 9781119625568, and for eText: 9781119625681. The textbook will contain your access to Analytic Solver Platform, and the relevant details will be provided in the first meeting.

EVALUATION

Midterm (35%)

There will be one midterm test to be completed online on November 7th 2020 from 10am to 1pm EST. You will write this exam on your computer while being at your preferred location. Please note that each student has to write the midterm test. If you are unable to write the exam on the scheduled date, and have advanced knowledge and permission, the instructor will provide you with an opportunity to write an alternate version of the test at an alternate time. *Note that this is not automatic and that a written request for alternate exam has to be made, along with the supporting documents, well ahead of the scheduled date.*

Case Study (30%)

The instructor will assign a case study (with the relevant data sets and questions) that would require you to logically model and solve the posed problem. It is important to consider all the three pertinent stages of problem solving, i.e., studying the posed situation; model development; and, solution/ analysis and recommendation.

- You will work on this assignment in a team of 3-4 students. The group must be finalized by the end of the class on October 7th/ October 9th for the two sections.
- Each group will be expected to prepare a short presentation highlighting the managerial problem, (mathematical and) computer model, assumptions, solutions and recommendations. (30% weight).
- A written report containing the complete details of the case study is due before their in-class presentation. It is important that the report be professionally typewritten using 12 point Times New Roman font, and double spaced. Please proof-read the report before submission. (70% weight equally divided between analysis and presentation & exposition).

Final Exam (35%)

Final Exam will be held during the exam week, and more details will be provided in the class. It will not be cumulative, but can include some topics that serve as the building blocks for the post-term test material.

Components and Weights[1]

Case Study	(group)	30%
Term Test	(individual)	35%
Final Exam	(individual)	35%
Total		100%

Grade 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.

LETTER GRADE	PERCENT	POINTS
A+	90-100	12
A	85-89	11
A-	80-84	10
B+	75-79	9
B	70-74	8
B-	60-69	7
F	00-59	0

[1] 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.

LEARNING ACTIVITIES	DELIVERY	DESCRIPTION	TOOL(S)
Virtual Class	Synchronous	Live sessions led by the instructor	**Zoom**
Self-Study/Readings	Asynchronous	Tied to weekly topics	**Avenue to Learn** Multimedia learning materials, and assigned textbook
Group Work	Asynchronous	Microsoft Teams private groups	**Microsoft Teams**
Office hours	Synchronous	Live with instructor and TA	**Zoom**

COMMUNICATION AND FEEDBACK

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

http://mbastudent.degroote.mcmaster.ca/contact/anonymous/

Students who wish to correspond with instructors or TAs 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. Emails regarding course issues should NOT be sent to the Administrative Assistant.

Instructors are encouraged to 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.

ACADEMIC DISHONESTY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at: www.mcmaster.ca/academicintegrity

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations

AUTHENTICITY/PLAGIARISM DETECTION

This course will use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software.

All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

ON-LINE ELEMENT

This course will use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course.

The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

ON-LINE PROCTORING

This course may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

MISSED ACADEMIC WORK

Missed Mid-Term Examinations / Tests / Class Participation

Where students miss a regularly scheduled mid-term or class participation for legitimate reasons as determined by the Student Experience – Academic (MBA) office, the weight for that 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 Student Experience – Academic (MBA) office within five (5) working days upon returning to school.

To document absences for health related reasons, please provide to Student Experience – Academic (MBA) office 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://mbastudent.degroote.mcmaster.ca/forms-and-applications/. Please do not use the online McMaster Student Absence Form as this is for Undergraduate students only. 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 Student Experience – Academic (MBA) office the Petition for Relief for MBA Missed Term Work and documentation supporting the reason for the absence.

Students unable to write a mid-term 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 mid-term exams; or other extenuating circumstances, have the option of applying for special exam arrangements. Such requests must be made to the Student Experience – Academic (MBA) 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 Student Experience – Academic (MBA).

If a mid-term exam is missed without a valid reason, students will receive a grade of zero (0) for that component.

Missed Final Examinations

A student who misses a final examination without good reason will receive a mark of 0 on the examination.

All applications for deferred and special examination arrangements must be made to the Student Experience – Academic (MBA) 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 following term. There will be one common sitting for all deferred exams.

Failure to write an approved deferred examination at the pre-scheduled time will result in a failure for that examination, except in the case of exceptional circumstances where documentation has been provided and approved. Upon approval, no credit will be given for the course, and the notation N.C. (no credit) will be placed on the student's transcript. Students receiving no credit for a required course must repeat the course. Optional or elective courses for which no credit is given may be repeated or replaced with another course of equal credit value.

Requests for a second deferral or rescheduling of a deferred examination will not be considered.

Any student who is unable to write a final examination because of illness is required to submit the Application for Deferred MBA Final Examination and a statement from a doctor certifying illness on the date of the examination. The Application for Deferred MBA Final Examination and the McMaster University Student Health Certificate can be found on the DeGroote website at http://mbastudent.degroote.mcmaster.ca/forms-and-applications/ Please do not use the online McMaster Student Absence Form as this is for Undergraduate students only. Students who write examinations while ill will not be given special consideration after the fact.

In such cases, the request for a deferred examination privilege must be made in writing to the Student Experience – Academic (MBA) office within five business days of the missed examination.

Special examination arrangements may be made for students unable to write at the posted exam time due to compelling reasons (for example religious, or for part-time students only, work-related reasons):

- Students who have religious obligations which make it impossible to write examinations at the times posted are required to produce a letter from their religious leader stating that they are unable to be present owing to a religious obligation.
- Part-time students who have business commitments which make it impossible to write examinations at the times posted are required to produce a letter on company letterhead from the student's immediate supervisor stating that they are unable to be present owing to a specific job commitment.

In such cases, applications must be made in writing to the Student Experience – Academic (MBA) office at least ten business days before the scheduled examination date and acceptable documentation must be supplied.

If a student is representing the University at an academic or athletic event and is available at an overlapping scheduled time of the test/examination, the student may write the test/examination at an approved location with an approved invigilator, as determined by the Student Experience – Academic (MBA) office.

In such cases, the request for a deferred examination privilege must be made in writing to the Student Experience – Academic (MBA) office within ten business days of the end of the examination period.

Note: A fee of $50 will be charged for a deferred exam written on campus and a fee of $100 for deferred exams written elsewhere. In cases where the student's standing is in doubt, the Graduate Admissions and Study Committee may require that the student with one or more deferred examination privileges refrain from re-registering until the examination(s) have been cleared.

STUDENT ACCESSIBILITY SERVICES

Student Accessibility Services (SAS) offers various support services for students with disabilities. Students are required to inform SAS of accommodation needs for course work at the outset of term. Students must forward a copy of such SAS accommodation to the instructor normally, within the first three (3) weeks of classes by setting up an appointment with the instructor. If a student with a disability chooses NOT to take advantage of an SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. The SAS website is:

http://sas.mcmaster.ca

RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVATIONS (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

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.

ACKNOWLEDGEMENT OF COURSE POLICIES

Your registration and continuous participation (e.g. on A2L, in the classroom, etc.) to the various learning activities of MBA O701 will be considered to be an implicit acknowledgement of the course policies outlined above, or of any other that may be announced during lecture and/or on A2L. **It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.**

Lack of awareness of the course policies **cannot be invoked** at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand.

COURSE SCHEDULE

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WEEK	DATE	ASSIGNMENT
1	Sept. 16/18	• Introduction to Business Analytics • Analytics using Spreadsheets • Data Exploration and Preparation
2	Sept. 23/25	• Linear Optimization
3	Sept. 30/ Oct.02	
4	Oct. 07/09	• Optimization of Network Flows **Due:** October 7th: Group List
5	Oct. 14/16	• Integer Optimization
6	Oct. 21/23	• Classification and Prediction Methods
7	Oct. 28/30	
8	Nov. 04/06	**No-class (preparation time for Midterm)**
	Nov. 07	**Mid-term: 10am to 1pm (EST)**
9	Nov. 11/13	• Nonlinear Optimization
10	Nov. 18/20	• Optimization of Nonsmooth Models
11	Nov. 25/27	• Monte Carlo Simulation
12	Dec.02/04	• Optimization in Simulation
13	Dec. 09/11	Case Study Presentations **Due:** • December 8th/10th, 5 pm EST: Presentation slides • December 12th, 5 pm EST: Case report.