Commerce 4DA3
Modelling and Prescriptive Analytics
Fall 2026 Course Outline

Operations Management Area
DeGroote School of Business
McMaster University

INSTRUCTOR AND TA CONTACT INFORMATION

Section 1: Mon 11:30AM – 2:20PM

Dr. Zeinab Vosooghi
Instructor
vosooghz@mcmaster.ca
Office Hours: TBA on A2L
Class Location: See Mosaic

Teaching Assistant
TA information and office hours to be announced on Avenue to Learn (A2L)

COURSE ELEMENTS

Credit Value:	3	Leadership:	No	IT skills:	Yes	Global view:	Yes
A2L:	Yes	Ethics:	Yes	Numeracy:	Yes	Written skills:	Yes
Participation:	Yes	Innovation:	Yes	Group work:	Yes	Oral skills:	Yes
Evidence-based:	No	Experiential:	Yes	Final Exam:	Yes	Guest speaker(s):	No

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COURSE INFORMATION

Lectures: 3hours x1 / week
Course Delivery Mode: Lectures - In-person
Course Description: This course will enable students to gain familiarity with analytics and then develop a comprehensive understanding of prescriptive analytics. They will develop the ability to logically model managerial problems drawn from various functional areas in a spreadsheet domain (and in some instances mathematically). Students will use the optimization and simulation modules in Analytic Solver (a spreadsheet add-in) and other software to solve the posed problems, and to analyze them to develop useful managerial insights.

IMPORTANT LINKS

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library

LEARNING OUTCOMES

Upon completing this course, students will be able to:

- Apply prescriptive analytics techniques to a variety of managerial decision problems.
- Formulate managerial problems as logical and quantitative models.
- Develop, solve, and analyze decision models using Excel and Analytic Solver.
- Apply optimization, simulation, and scenario analysis to evaluate alternative decisions.
- Interpret analytical results and draw meaningful managerial insights.
- Apply analytical modeling techniques to real-world business problems.
- Communicate analytical findings and decision recommendations clearly.

COURSE LEARNING GOALS

This course aims to:

- Introduce students to key concepts and techniques in prescriptive analytics.
- Develop students' ability to formulate managerial problems as quantitative models.
- Provide hands-on experience in developing and analyzing decision models using Excel and Analytic Solver.
- Help students apply optimization, simulation, and scenario analysis to business decision problems.
- Develop students' ability to interpret analytical results and translate them into meaningful managerial insights.
- Provide experience applying prescriptive analytics to practical business problems and communicating recommendations based on model results.

COURSE MATERIALS AND READINGS

Required:

- Avenue – Registration/access is required for course materials, announcements, and other course-related resources.
- Analytic Solver Platform (www.solver.com). The requisite license will be purchased by the school, and the relevant installation details will be shared in class and on Avenue.

Optional but recommended:

Textbook Listing: https://campusstore.mcmaster.ca/
ISBN: 9781119856238
Title: Etext Modeling And Analytics Using Excel
Author: Powell
Publisher: Wiley Canada
Cover: CampusEbookstore

Note:
The textbook serves as references and provide details for the materials covered in the lectures. The lectures, lecture slides and other materials delivered by the instructor (such as practice problems) prioritize over the textbook for the purpose of preparing for the exams. Topics not covered during the lectures will not be tested in the exams or assignments. The lectures may cover some materials not included in the textbook.

CLASS FORMAT

Activity	Delivery	Description	Tools
Lectures	In-Person*	In-person weekly 3-hour classes	Top Hat for participation
Assessments	See details in "Course deliverables"		In-person/A2L

* This is an in-person 3-hour course. The three hours will consist of problem-solving, mini-lecture, and in-depth applied exercises (not necessarily always in this order). There will be a short break part way through at a convenient time based on what we are working on. Please use this time to take care of personal needs of various kinds.

COURSE EVALUATION

Your grade of the course will be the **higher** one between the two grades calculated from Schemes 1& 2 below.

Scheme 1:

Components	Weight
Assignment 1-3 (group)	10% * 3
Midterm	30%
Final	40%
Total	100%

Scheme 2:

Components	Weight
Class participation	10%
Assignment 1-3 (group)	10% * 3
Midterm	30%
Final	30%
Total	100%

COURSE DELIVERABLES

Midterm (30%)

There will be one midterm test to be completed on **October 26, 2026, from 11:30AM to 2:20PM**. You will write this exam on your computer. Please note that each student must 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 a written request for alternate exam has to be made, along with the supporting documents, well ahead of the scheduled date.***

Assignments (3: each worth 10%)

You will work on the assignments in a team of 5 students. The due dates are as follows
- *Assignment # 1: 5:00pm on October 12, 2026.*
- *Assignment # 2: 5:00pm on November 15, 2026.*
- *Assignment # 3: 5:00pm on December 7, 2026.*

Final Exam (30% or 40%)

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. *If you are unable to write the exam at the designated date, then you will have to write the deferred exam in February 2027.*

Participation (10% or 0%)

Class participation is not mandatory. In each class, there will typically be one, two, or three short questions or exercises through the Top Hat app. These questions will usually be multiple-choice and are designed to be quick and straightforward. Students will typically have one to one and a half minutes to respond to each question, after which the question will be closed.

The questions may be unannounced and are intended to encourage students to stay engaged with the course material. All Top Hat questions completed during class will count toward the participation grade.

For each question, a correct answer will receive full participation credit, while an incorrect answer will receive 50% of the participation credit. Students must be present and respond to the questions through Top Hat to receive participation credit.

At the end of the course, each student's final grade will be calculated using both grading schemes outlined in the Course Evaluation section. The higher of the two calculated grades will be used as the student's final course grade.

Partial participation is also recognized. Students are not required to participate in every class to receive participation marks. The participation component will be calculated based on the number of Top Hat questions answered and the corresponding credit received.

Example:
Student Alex has the following grades:
Midterm: 70/100
Final Exam: 75/100
Assignments: 100/100
Participation: Alex was present and answered 12 out of 20 Top Hat questions. Of the 12 questions answered, 10 were correct and 2 were incorrect.

Schema 1: 70 × 30% + 75 × **40**% + 100 × 30% = 81
Schema 2: 70 × 30% + 75 × **30**% + 100 × 30% **+ [(10 + 2 × 0.5) / 20 × 10%]** = 75.4
Final Grade: 81, as the higher grade under Schema 1 is used.

COMMUNICATION AND FEEDBACK

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.

All students must receive feedback regarding their progress prior to the final date by which a student may cancel the course without failure by default.

- *For Level 3 courses and above, this feedback must equal a minimum of 10% of the final grade.*

Instructors may solicit feedback via an informal course review with students by Week #4 to allow time for modifications in curriculum delivery.

Students who have concerns about the course content, evaluation methods, or delivery should first reach out to the course instructor. If your concern remains unresolved after speaking with the instructor, you may then reach out to the relevant Area Chair for further consideration.

REQUESTING RELIEF FOR MISSED ACADEMIC WORK

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work" and the link below*;

http://ug.degroote.mcmaster.ca/forms-and-resources/missed-course-work-policy/

- Non-Commerce students must follow the Missed Course Work protocols outlined by their home faculty and Program Office.

COURSE MODIFICATION

From time to time there may be a need to remove/add topics or to change the schedule or the delivery format. If these are necessary, you will be given as much advance notice as possible.

GENERATIVE AI

Students may use generative AI in this course **except for the exams** so long as the use of generative AI is referenced and cited. Use of generative AI outside assessment guidelines or without citation will constitute academic dishonesty. It is the student's responsibility to be clear on the expectations for citation and reference and to do so appropriately.

ACADEMIC INTEGRITY

Students are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

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. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy.

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.

- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

AUTHENTICITY/PLAGIARISM DETECTION

This course may 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. Avenue to Learn, 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.

COURSES WITH AN ON-LINE ELEMENT

This course will use on-line elements (e.g. email, Avenue to Learn, Top Hat, web pages, 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.

ONLINE PROCTORING

If online proctoring software is used for tests and exams, it 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.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

Academic Accommodation For Religious, Indigenous or Spiritual Observances (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.

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn and/or McMaster email.

ACKNOWLEDGEMENT OF COURSE POLICIES

Your enrolment in Commerce 4DA3 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

Commerce 4DA3
MODELLING AND PRESCRIPTIVE ANALYTICS
Fall 2026 Course Schedule

WEEK	DATE	TOPICS/ DELIVERABLES
1, 2	Sep. 14, Sep. 21	• Introduction to Business Analytics • Analytics using Spreadsheets Data • Data Exploration and Preparation
3, 4	Sep. 28, Oct. 5	• Linear Optimization
5	Oct. 12	• Thanksgiving – no classes • **Due: Assignment #1 (5:00 pm EST; Oct. 12)**
6	Oct. 19	• Optimization of Network Flows
7	Oct. 26	• Mid-Term Exam
8	Nov. 2	• Integer Optimization
9	Nov. 9	• Nonlinear Optimization • **Due: Assignment #2 (5:00 pm EST; Nov. 15)**
10	Nov. 16	• Optimization of Nonsmooth Models
11	Nov. 23	• Monte Carlo Simulation
12	Nov. 30	• Optimization in Simulation
13	Dec. 7	• Classification and Prediction methods • Practice Problems • **Due: Assignment #3 (5:00 pm EST; Dec. 7)**