Commerce 2DA3 – Cohort 1
Decision Making with Analytics
Spring/Summer 2023 – Tentative Course Outline

COURSE OBJECTIVE

The analysis of decision problems is an essential part of the modern business world. This course will provide an understanding of the usefulness of descriptive and prescriptive business analytics: linear programming, decision analysis, practical use of MS Power BI, and simulation as decision-making aids for business problems.

PREREQUISITES

COMMERCE 1DA3 (or 2QA3), IBH 2AD3 or one of STATS 2MB3, 3J04, 3N03 or 3Y03; and registration in any four or five level program or applicable minor (see Faculty Note 2.)

TEACHING STAFF AND CONTACT INFORMATION

Instructor:
Apoorv Thawani
thawania@outlook.com

Office Hours:
Thursday 5:30pm – 6:30pm
Click here to attend

Teaching Assistant:
Amin Shahmardan
shahmara@mcmaster.ca

Office Hours:
TBA

CLASS SCHEDULE

Class	Day & Time	Room
C01	Monday and Wednesday: 7:00pm – 10:00pm	BSB_B136

TUTORIAL SCHEDULE

Tutorials	Day & Time	Room
T01	Monday and Wednesday: 6:00pm – 7:00pm	BSB_B136

Note: There is no Tutorial on June 19th, 2023

COURSE ELEMENTS

Credit value: 3	Leadership: Yes	IT skills: Yes	Global view: Yes
Avenue to Learn: Yes	Ethics: Yes	Numeracy: Yes	Written skills: Yes
Participation: Yes	Innovation: Yes	Group work: No	Oral skills: Yes
Evidence-based: Yes	Experiential: Yes	Final exam: Yes	Guest speaker(s): No

COURSE DESCRIPTION

The course will study five widely used business analytics and management science tools (problem modeling, problem visualization, linear programming, decision analysis, and simulation) used in business decision problems when conditions are reasonably certain or somewhat uncertain. All five tools are implemented in Excel. The course is taught through lectures, textbook readings, tutorials, practice problems, and computer works with Excel and Power BI.

LEARNING OUTCOMES

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

- Using analytics to create Excel models of decision problems which occur in different business functional areas such as operations, finance, and marketing;
- Visualize business-oriented models and their outcomes in Excel and Power BI, draw meaningful conclusions by using plots, tables, and many built-in functions.
- Formulate decision problems. Use Excel Solver to model and solve these problems, perform sensitivity analysis, and determine the marginal value of the resources used;
- Analyze business decision problems under uncertainty and risk using payoff tables and decision-tree models in Excel.
- Use Excel to model and analyze business processes using simulation models.

REQUIRED COURSE MATERIALS

Textbook: **J. D., Cochran, J. J., Fry, M. J., & Ohlmann, J. W. *Business Analytics*. Fourth Edition, Cengage Learning (2020)**

- The textbook is **highly recommended but is not required**. Any new book, used book, electronic book, etc. can be used. The electronic book is an **e-text specifically designed for this course and has a lower price**, it is sold via Access Code in the Bookstore for $78.95. To purchase that Access Code click here to go to the Bookstore Buy Access Codes Online.
- This course uses http://avenue.mcmaster.ca to post the outline, lecture notes, and feedback.

Software: Students are encouraged to use their computer in class. The following software is used in the course:

- Excel: Excel 2010 or later is preferred. Microsoft Office 365 is available for students.
- Power BI: Power BI is available for students
- Excel Solver add-in: Available in Excel on Windows and Mac.
- TreePlan: Excel add-in for building and analyzing decision trees. Available on Avenue.

- First completely update Microsoft Office. Then completely update Excel. If Excel is not completely updated the add-ins and modules may not work.

- Students may need to set the security setting on Excel to 'medium' to 'enable' the 'macros' in these programs.

- All software runs on a Windows; students using a Mac must ensure that the software runs properly on their computer. Students will be tested at the Midterm Exam and at the Final on their proficiency with the software. Some quiz questions will also require students to use Excel and/or Power BI.

Students are encouraged to attend class, and to bring their textbook, their computer, and the lecture notes (either electronic or paper form) to class. Students are expected to read the assigned materials in the textbook before coming to class.

EVALUATION

Component	Best of below weighting schemes		
Midterm Exam	30%	40%	approx. 2 hours and 30 mins,
Final Exam	40%	30%	approx. 2 hours and 30 mins
Quizzes x 4	7.5% each		Virtual, approximately 20 mins
Total	**100%**		

Tutorials: Tutorials are designed to familiarize you with the course topics and to give you a chance to practice course material, see different question types. All tutorial questions and solutions will be posted on Avenue to Learn. Tutorials will be led by a TA. See below for the schedule.

Quizzes: There are 4 individual quizzes in this course with 7.5% each. They are all 20 – 30 minutes long and aim to prepare you for the major exams (midterm/final). The first 2 quizzes will be before the Midterm Exam and the last two will be after it. Details and deadlines are provided in this outline as well as the avenue page of the course.

Exams: Both the Midterm Exam and the Final Exam are 2.5 hours long and will be in-person held at the McMaster main campus. The exam room will be announced on A2L as we approach the exam date. Do note that the exam will have a hybrid format which will combine paper-based questions and laptop using the tools and techniques taught in the lectures, so make sure that you bring your laptop fully charged to the exam. The Final Exam is not comprehensive; rather it only tests material since the Midterm Exam. However, the first few topics (covering Excel functions, Power BI, and models) are essential and the later chapters are built on that knowledge. Both exams will include questions which test students' proficiency with the software and the analytics methodologies in the course. For software-based questions, the students will be asked to submit Excel/Power BI files to Avenue.

Marks: Marks are posted on Avenue to Learn. Exams are not returned. Students must first review their Exam with the TA during office hours within two weeks of the marks being posted on Avenue. After this is done students can review their Exam with the instructor/TA during office hours.

Final Grades: At the end of the course overall percentage grades are converted to a letter grade in accordance with the following conversion scheme (there is also an Excel file enabling you to calculate your final grade based on your score estimations – see 1c-Grade calculator on the avenue page of the course):

Letter Grade	Percentage	Letter Grade	Percentage
A+	90 – 100	C+	67 – 69
A	85 – 89	C	63 – 66
A-	80 – 84	C-	60 – 62
B+	77 – 79	D+	57 – 59
B	73 – 76	D	53 – 56
B-	70 – 72	D-	50 – 52
		F	00 – 49

COMMUNICATION AND FEEDBACK

1. Students who are uncomfortable directly approaching an instructor regarding a course concern may send a confidential email to the Operations Management Area Chair or the Associate Dean.

2. Students' e-mails to instructors or TAs must originate from their official McMaster University e-mail account. This protects the confidentiality of information and confirms the identity of the student. E-mails regarding course issues should NOT be sent to the Area Administrative Assistant. 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. This feedback must equal a minimum of 10% of the final grade

ACADEMIC DISHONESTY

Students 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 the student's 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

REQUESTING RELIEF FOR MISSED ACADEMIC WORK

Students may request relief from a regularly scheduled midterm, test, assignment or other course components in the following ways:

a) For missed coursework worth less than 25% of the final grade (and/or absences from classes lasting up to three (3) days)
b) For missed coursework worth 25% or more of the final grade (and/or absences from classes lasting more than three (3) days)
c) For conflicts arising from Student Experience - Academic Office approved events.

a) For missed coursework worth less than 25% of the final grade (and/or absences from classes lasting up to three (3) days):

Students must use the MSAF (McMaster Student Absence Form). This is an on-line, self-reporting tool, for which submission of medical or other types of supporting documentation is normally not required. Students may use this tool to submit a maximum of one (1) request for relief of missed academic work per term as long as the weighting of the component is worth less than 25% of the course weight. Students must follow up with their course instructors regarding the nature of the relief within two days of submitting the form. Failure to do so may negate the opportunity for relief. It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work in his/her course.

For more information, please refer to the policy and procedure on the DeGroote website at the link below;

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

b) For missed coursework worth 25% or more of the final grade (and/or absences from classes lasting more than three (3) days):

Students cannot use the MSAF. They MUST report to their Faculty Office (the Student Experience –Academic Office for Commerce students) to discuss their situation and will be required to provide appropriate supporting documentation. Students who wish to submit more than one request for relief of missed academic work per term cannot use the MSAF. They must report to the Student Experience – Academic Office and discuss their situation with an academic advisor. They will be required to provide supporting documentation and possibly meet with the Manager.

The MSAF cannot be used during any final examination period. If a mid-term exam is missed without a valid reason, students will receive a grade of zero (0) for that component.

c) For conflicts arising from Student Experience – Academic Office approved events:

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. Please see the DeGroote Missed Course Work Policy for a list of conflicts that qualify for academic accommodation:

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

Such requests must be made to the Student Experience – Academic Office at least ten (10) working days before the scheduled exam along with acceptable documentation. Non-Commerce students must submit their documentation to their own Faculty Office and then alert the Student Experience – Academic Office of their interest in an alternate sitting of the midterm.

Adjudication of all requests must be handled by the Student Experience – Academic Office. Instructors cannot themselves allow students to unofficially write make-up exams/tests.

STUDENT ACCESSIBILITY SERVICES

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information, consult McMaster University's Policy for Academic Accommodation of Students with Disabilities:

https://secretariat.mcmaster.ca/app/uploads/Academic-Accommodations-Policy.pdf

POTENTIAL MODIFICATIONS TO THE COURSE

The instructor reserves the right to modify elements of the course during the term. There may be changes to 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.

COURSES WITH AN ON-LINE ELEMENT

Some courses may 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.

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, A2L and/or McMaster email.

ACKNOWLEDGEMENT OF COURSE POLICIES

Your enrolment in Commerce 2DA3 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 Avenue to Learn. **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 (TENTATIVE)

Date	**Topics/Readings** *Readings are in the textbook.* *Lecture Notes are on Avenue.*
Week 1.1 (June 19th, 2023)	Introduction to course Ch. 1: Introduction Append. A: Basics of Excel
Week 1.2 (June 21st, 2023)	Append. A: Basics of Excel (Cont'd) Ch. 3: Data Visualisation Ch. 10: Spreadsheet Models
Week 2.1 (June 26th, 2023)	Ch. 3: Data Visualisation (Cont'd) Ch. 10: Spreadsheet Models (Cont'd) Introduction to Power BI
Week 2.2 (June 28th, 2023)	Data Visualization and Dashboards in Power BI
Quiz 1 – Open from July 2nd, Sun, 12 noon to July 3rd, Mon, 12 noon	**Covers Data Analytics and Excel parts**
Week 3.1 (July 5th, 2023)	Ch. 12: Linear Optimization Models
Quiz 2 – Open from July 9th, Sun, 12 noon to July 10th, Mon, 12 noon	**Covers Power BI and Ch. 12 (up to what we have seen so far)**
Week 4.1 (July 10th, 2023)	Ch. 12 (if necessary) Review of the Midterm topics
Week 4.2 (July 12th, 2023)	Supplementary Class
Midterm – July 14th, 2023 at 7:00 pm – 9:30 pm Location: LRW B1007	**Covers all topics so far**
Week 5.1 (July 17th, 2023)	Ch. 12: Linear Optimization Models (Cont'd) – Sensitivity Analysis
Week 5.2 (July 19th, 2023)	Ch. 15: Decision Analysis
Quiz 3 – Open from July 23rd, Sun, 12 noon to July 24th, Mon, 12 noon	**Covers Chs. 12, 15 (up to what we have seen so far since midterm)**
Week 6.1 (July 24th, 2023)	Ch. 15: Decision Analysis (Cont'd) – Decision Tree Ch. 11: Monte Carlo Simulation
Week 6.2 (July 26th, 2023)	Ch. 11: Monte Carlo Simulation (Cont'd)
Quiz 4 – Open from July 30th, Sun, 12 noon to July 31st, Mon, 12 noon	**Covers Ch. 11 and 15 (Decision Tree)**
Week 7.1 (July 31st, 2023)	Solving Practice Questions for Final Exam
Week 7.2 (August 2nd, 2023)	Supplementary Class
Final Exam – August 4th, 2023 at 7:00 pm – 9:30 pm Location: LRW B1007	**Covers all topics since midterm**