# Introduction to Management Science

AP/ADMS 3330 Section N
Winter 2024

## Course Information

Course Instructor: Yundi Chen
E-mail: ydchen@yorku.ca
Office Hours & Location: After classes
or by appointments (see more details
on Page 3.)

Course Time & Days: Mondays 16:00 to
19:00
Class Location: DB 0007
Course eClass site:
https://eclass.yorku.ca/my/

Tutorials or Labs
Please see course website for tutorial sessions.

## Land Acknowledgment

York University recognizes that many Indigenous Nations have longstanding
relationships with the territories upon which York University campuses are located that
precede the establishment of York University. York University acknowledges its
presence on the traditional territory of many Indigenous Nations. The area known as
Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee
Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and
Métis communities. We acknowledge the current treaty holders, the Mississaugas of
the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum
Belt Covenant, an agreement to peaceably share and care for the Great Lakes region
(LA&PS Land Acknowledgement).

### Using Generative Artificial Intelligence in this Course
Students are <u>NOT</u> allowed to use generative AI tools, such as ChatGPT, in this course.

# Course Overview

## Course Description

This course is an introduction to the basic theory underlying Management Science and Operations Research. This course not only helps the students learn how to model real-life problems as mathematical models but also provides them with the mathematical foundation and the spreadsheet skills to solve them. Specifically, using spreadsheets, the course focuses on modeling a variety of applications of finance, marketing and production/operations management with spreadsheets. Some of these applications include inventory control, workforce management, location and distribution problems, revenue management, portfolio selection, capital budgeting, and optimal sales allocation. The course also focuses on theories on basic optimization techniques such as the simplex method for solving linear programming, duality theory, branch-&-bound algorithm for solving integer linear programming, and multi-criteria decision making. Prerequisite: AP/ADMS 2320 3.00. Course credit exclusion: AP/ADMB 3330 3.00.

## Course Learning Objectives

By the end of this course, students will be able to:
- Effectively utilize a series of quantitative techniques in real world scenarios
- Provide strategic direction using analytics and problem-solving skills
- Be proficient in in displaying quantitative outcomes both visually and numerically
- Gain an in-depth understanding of basic, intermediate, and advanced quantitative methods

## Course Format and Organization

All classes will be held on campus. During the lecture, material will be covered as described in the course schedule.

## Technical Requirements

Students are required to have access to Microsoft Excel, PowerPoint and a non-programmable calculator. *Students must also have a stable Internet connection, or you should not be taking the course.*

## Course Communication Plan and Office Hours

Communication in the course will occur during lecture and through announcements and postings on the course website. If you have course related questions, you can use email to send inquiries or ask during class sessions.

1. Please ensure you read all documentation on the course website.
2. It will be your responsibility to regularly check online posts and your email.

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Office hours will be held after lectures or by appointment.

Please send your questions via email. All questions will be answered within 24 to 72 hours' time with the exception of weekends. A one-on-one Zoom meeting may be set up depending on the nature of the question. Please note that emails from public email providers such as Gmail and Hotmail might be caught in spam. It is best to use your York email account for this course.

## Course Evaluation

| Assessment | Due Date | Weight % | Course Learning Outcome |
|---|---|---|---|
| Term Test 1 | See Course Schedule | 30% | Assessment of knowledge pertaining to specific lectures. |
| Term Test 2 | See Course Schedule | 30% | Assessment of knowledge pertaining to specific lectures. |
| Final Exam | See Course Schedule | 40% | Assessment of knowledge pertaining to specific lectures. |
| | | 100% | |

## Assessment Descriptions
1. The two Term Tests and the Final Examination will be held online at the same time for all students.
2. Information concerning the Term Tests and Final Exams will be posted on the course website.
3. Term Tests and Final Exams will all be online. The two Term Tests and the Final Examination are to be finished by students individually. Students may not receive assistance or coaching from other individuals while writing any test or the exam. Students found engaging in these practices will be subject to an academic dishonesty case.
4. For the Term Tests and Final Exam, you will need to upload your solutions on the eClass testing site by scanning or taking a photo of your work as required for each question. (Note: When the allotted time is over, eClass will automatically

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submit whatever work/files you have uploaded. You do not have to send an email to your professor asking to check whether your work/files have been uploaded. It is your responsibility to ensure they are uploaded properly within the time provided. Such email inquiries will not be answered). eClass will not allow uploads in the last minute of the exam. All files must be uploaded before the last minute.

5. Both Term Tests and the Final Examination may consist of multiple-choice questions and/or worded questions.

6. If a Term Test is missed, the weight of one, and only one, missed Term Test (30%) will be automatically (no documents such as doctor notes needed) transferred to a cumulative Final Examination. If both Term Tests are missed, the cumulative Final Examination will only weigh 70%.

7. The Final Examination will be comprehensive if any one of the two Term Tests is missed. That is, if a student misses one or two Term Tests, he/she will be writing a Final Examination that includes material from the entire semester.

8. There are no alternative exam dates for Term Tests.

9. If students miss the Final Examination and must defer the exam, the deferred exam will be a cumulative examination.

10. The Final Examination grades will not be posted by the instructor. Instead, students should check their overall grades from the York official website under their personal accounts some time after the Final Examination.

11. Online tests will be marked online, and the results will be posted on eClass or another grade site. If you need to get markers' feedback, you will need to put a request by emailing your professor within five days from the date the marks are posted. Any query after five days will not be entertained.

12. After getting markers' feedback, if you are still not satisfied then you can request your professor to re-appraise the test. However, note that the whole test, not just the part under question, will be re-assessed. Three outcomes are possible, your mark might stay the same; increase; or decrease.

13. Accommodations must be provided within the first 2 weeks of class.

14. Your solutions need to be hand-written.

15. You are not allowed to use ANY software to solve and/or type your answers in any of your Tests/exam, if used then that will not be considered part of your Test/Exams, hence will not be marked.

16. While taking your Quizzes, Term Tests/Final Exam, the questions will sequentially be provided to you. You will be asked to answer a question and submit your answer, and then move on to the next question. After you submit your answer to a question, there will be no further access to that question in the test.

## Missed Tests and Exams

See above.

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## Grading

The grading scheme for this course conforms to the 9-point system used in undergraduate programs at York University. For a full description of the York grading system, visit the York University Academic Calendar.

| GRADE | GRADE POINT | PERCENT RANGE | DESCRIPTION |
|-------|-------------|---------------|-------------|
| A+ | 9 | 90-100 | Exceptional |
| A | 8 | 80-89 | Excellent |
| B+ | 7 | 75-79 | Very Good |
| B | 6 | 70-74 | Good |
| C+ | 5 | 65-69 | Competent |
| C | 4 | 60-64 | Fairly Competent |
| D+ | 3 | 55-59 | Passing |
| D | 2 | 50-54 | Marginally Passing |
| E | 1 | (marginally below 50%) | Marginally Failing |
| F | 0 | (below 50%) | Failing |

## Course Schedule: Weekly Readings and Activities

### Required Course Materials
- Anderson, Sweeney, Williams, Camm, Cochran, Fry, and Ohlmann, An Introduction to Management Science:  Quantitative Approaches to Decision Making, 15th Edition, 2019 South-Western Cengage Learning.
- Supporting/Additional material (if any) will be posted on the course website.
- *Material can be purchased from the YU Bookstore.*

### Optional Materials
- Spreadsheet Modeling and Decision Analysis, A Practical Introduction to Business Analytics,  8th edition, C.T. Ragsdale, 2016.

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## Course Schedule

| Lecture | Date | Topic | Quiz/Chapters |
|---|---|---|---|
| 1 | Jan. 8 | Introduction to Optimization, LP - Graphical Method | Ch. 2 |
| 2 | Jan. 15 | LP Sensitivity Analysis | Ch. 3 |
| 3 | Jan. 22 | LP Applications | Ch. 4 |
| 4 | Jan. 29 | Integer LP& 0-1 variables | Ch. 7 |
| 5 | Feb. 5 | Distribution and Network Models | Ch. 6 |
|  | Feb. 11 SUNDAY | Common Term Test 1 (Lectures 1 – 3): 10:00 AM - 13:00 PM Location: ONLINE on eClass |  |
| 6 | Feb. 12 | Multicriteria Decisions (14.4, 14.5, 14.6 related to AHP Model are omitted.) | Ch. 14 |
|  | Feb. 19 | No-Class: Reading Week |  |
| 7 | Feb. 26 | Advanced LP Applications | Ch. 5.1, 5.2, and 5.3 |
|  | Mar. 3 SUNDAY | Common Term Test 2 (Lectures 4 – 6): 10:00am-12:00pm Location: ONLINE on eClass |  |
| 8 | Mar. 4 | Advanced LP Applications (cont.) | Ch. 5.4 |
| 9 | Mar. 11 | Nonlinear Optimization Models | Ch. 8 |
| 10 | Mar. 18 | Time Series Analysis and Forecasting | Ch. 15 |
| 11 | Mar. 25 | Simulation | Ch. 12 |
| 12 | Common Final Exam (Lectures 7 – 11) (Date, time & location to be announced on registrar/university website) | | |

## Course Policies

All students are expected to familiarize themselves with the following information:
- Student Rights & Responsibilities
- Academic Accommodation for Students with Disabilities

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Please also review the following course policies:

## Academic Integrity

As a student at York University, you have a responsibility to both understand and uphold the integrity of the academic experience. The Faculty of Liberal Arts & Professional Studies supports the International Center for Academic Integrity's definition of academic integrity. That is, you will be committed to acting in all academic matters, even in the face of adversity, with honesty, trust, fairness, courage, respect and responsibility. Here is how you can demonstrate academic integrity in the completion of this course:

- Respect the ideas of others: Your course work should represent your own knowledge and ideas. You should not falsely claim credit for ideas that are not your own, by presenting another's work as yours. If you are quoting, paraphrasing, or summarizing another person's work in order to support your own ideas, identify the work and the author through proper citation practices. For more information about how to cite properly, use the Student Papers and Academic Research Kit (SPARK). You can improve your writing, research, and personal learning abilities through the Learning Commons, or by visiting the Writing Centre or ESL Open Learning Centre.

- Respect your peers: Know when you are allowed to collaborate. Ask your instructor about what group work entails when it comes to the sharing of work. In test situations and assignments, don't steal or give answers to your peers, whether in-person or online (e.g., in group chats and/or on third-party content-sharing websites, such as Chegg, Course Hero, etc.). Both cheating and aiding in a breach of academic honesty are violations of York University's academic honesty policy.

- Respect your course instructor(s): Understand what your instructors are asking of you in class, as well as on assignments, tests and/or exams. If you are unsure, ask your professor or teaching assistant. They are committed to making you feel supported and want to assess you fairly and with integrity. Please do not submit the same piece of work for more than one course without your instructor's permission. That can be considered an act of cheating.

- Respect yourself: When you act with integrity, you know that your work is yours and yours alone. You do not allow others to take tests for you. You do not buy or otherwise obtain term papers or assignments. You do the work. As a result, you know that you *earned* the grades that you receive, so you can be proud of your York degree. By acting with integrity in your course work, you are also practising a valuable professional skill that is important in all workplaces.

- Take responsibility: If you have acted in an academically dishonest way, you can demonstrate courage and take responsibility for your mistake. You can admit your mistake to your course instructor as soon as possible.

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Students who engage in academic dishonesty can be subject to disciplinary action under the *Senate Policy on Academic Honesty*. Your lack of familiarity with the Senate Policy does not constitute a defense against its application. Some academic offences can also constitute offences under the Criminal Code of Canada, which means that you may also be subject to criminal charges.

## Using Generative Artificial Intelligence in this Course

Students are NOT allowed to use generative AI tools, such as ChatGPT, in your course.

## Turnitin

To promote academic integrity in this course, students will normally be required to submit their written assignments to Turnitin (via the course's eClass site) for a review of textual similarities and the detection of possible plagiarism. In so doing, students will allow their material to be included as source documents in the Turnitin.com reference database, where they will be used only for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin service are described on the Turnitin.com website. York students may opt out of using Turnitin. If you wish to opt out, you should contact your instructor as soon as possible.

## Accessibility

While all individuals are expected to satisfy the requirements of their program of study and to aspire to achieve excellence, the University recognizes that persons with disabilities may require reasonable accommodation to enable them to perform at their best. The University encourages students with disabilities to register with Student Accessibility Services to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors through their Letter of Accommodation (LOA).

Please let your instructor know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course. Sufficient notice is needed so that reasonable steps for accommodation can be discussed. Accommodations for tests/exams normally require three (3) weeks (or 21 days) before the scheduled test/exam to arrange.

## Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making reasonable and appropriate accommodations to adherents for observances of special significance. Should any of the dates specified

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in this syllabus for course examinations, tests, or deadlines conflict with a date of religious significance, please contact the instructor within the first three (3) weeks of class. If the date falls within the formal examination periods, you must complete and submit a Religious Accommodation for Examination Form at least three (3) weeks before the start of the exam period.

## Intellectual Property

Course materials are designed for use as part of this particular course at York University and are the intellectual property of the instructor unless otherwise stated. Third-party copyrighted materials (such as book chapters, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian copyright law. Students may not publish, post on an Internet site, sell, or otherwise distribute any course materials or work without the instructor's express permission. Course materials should only be used by students enrolled in this course.

Copying this material for distribution (e.g., uploading material to a commercial third-party website) may lead to a charge of misconduct according to York's *Code of Student Rights and Responsibilities*, the *Senate Policy on Academic Honesty*, and/or legal consequences for copyright violations.

## Student Conduct in the Learning Environment

York University is committed to fostering teaching and learning environments that are free of disruptive and/or harassing behaviour, are physically safe, and conducive to effective teaching and learning. Students and instructors are expected to maintain a professional relationship characterized by courtesy, civility, and mutual respect and to refrain from actions disruptive to such a relationship. Individuals who fail to adhere to such standards and who violate University or public law may be subject to disciplinary action by the University.

For more information, see the policies on Disruptive and/or Harassing Behaviour in Academic Situations and Student Conduct and Responsibilities, as well as the *Code of Student Rights & Responsibilities*.

## Netiquette for eClass and Online Learning

Students and instructors have a joint responsibility to create and maintain a welcoming and inclusive learning environment. All students are expected to conduct themselves in accordance with the *Code of Student Rights and Responsibilities*. Please review and familiarize yourself with behaviours that support "netiquette" in virtual classrooms by consulting the Student Guide to eLearning.

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## Student Notice of Recording for Online Teaching and Learning

Activities for this course involve recording, in partial fulfillment of the course learning outcomes. Images, audio, text/chat messaging that have been recorded may be used and/or made available by the University to students enrolled in the course and those supporting the course for the purpose of materials review, for assessment, etc. Recordings will be managed according to the University's Common Record Schedule and will be securely destroyed when no longer needed by the University. Your personal information is protected in accordance with York University's *Guidelines on Access to Student Records and Protection of Privacy* and the *Freedom of Information and Protection of Privacy Act*. Access to online materials, including recordings or live meetings, is subject to York University's *Senate Policy on Computing and Information Technology Facilities*.

The University will use reasonable means to protect the security and confidentiality of the recorded information, but cannot provide a guarantee of such due to factors beyond the University's control, such as recordings being forwarded, copied, intercepted, circulated, disclosed, or stored without the University's knowledge or permission, or the introduction of malware into computer system which could potentially damage or disrupt the computer, networks, and security settings. The University is not responsible for connectivity/technical difficulties or loss of data associated with your hardware, software, or Internet connection.

By engaging in course activities that involve recording, you are consenting to the use of your appearance, image, text/chat messaging, and voice and/or likeness in the manner and under the conditions specified herein. In the case of a live stream recording, if you choose not to have your image or audio recorded, you may disable the audio and video functionality. If you choose to participate using a pseudonym instead of your real name, you must disclose the pseudonym to your instructor in advance to facilitate class participation.

You are not permitted to disclose the link to/URL of an event or an event session recording or copies of recording to anyone, for any reason. Recordings are available only to authorized individuals who have been directly provided the above instructions/link for their use. Recordings for personal use, required to facilitate your learning and preparation of personal course/lecture notes, may not be shared with others without the permission of the instructor or event coordinator, and may not be published, posted, linked to, or otherwise made available online, including on social media feeds, even if those feeds are private.

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## Student Support and Resources

To help you succeed academically, York University offers a wide range of resources and services. Everything from writing workshops and peer mentorship to wellness support and career guidance is available to fulfill our LA&PS students' needs. Explore the links below to access these on-campus resources:

- Academic Advising is available to provide students support and guidance in making academic decisions and goals.
- Student Accessibility Services are available for support and accessibility accommodation when required.
- Student Counselling, Health & Wellbeing offers workshops, resources, and counselling to support your academic success.
- Peer-Assisted Study Sessions (PASS) Program provides student study sessions for students to collaborate and enhance their understanding of course content in certain courses.
- Student Numeracy Assistance Centre at Keele (SNACK) supports students in courses involving math, stats, and Excel.
- The Writing Centre provides multiple avenues of writing-based support including drop-in sessions, one-to-one appointments, a Multilingual Studio, and an Accessibility Specialist.
- ESL Open Learning Centre (OLC) supports students with building proficiency in reading, writing, and speaking English.
- Learning Skills Services provides tips for time management, effective study and learning habits, keeping up with coursework, and other learning-related supports.
- Learning Commons provides links to supports for time management, writing, study skills, preparing for exams, and other learning-related resources.
- Roadmap to Student Success provides students with timely and targeted resources to help them achieve academic, personal, and professional success.
- Office of Student Community Relations (OSCR) is responsible for administering the *Code of Student Rights & Responsibilities* and provides critical incident support.
- goSAFE is staffed by York students and can accompany York community members to and from any on-campus location, such as the Village Shuttle pick-up hub, parking lots, bus stops, or residences.

For a full list of academic, wellness, and campus resources visit Student Support & Resources.

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