

## Modeling and Simulation for Management

AP/ADMS 4345 Section M

Winter 2024

### Course Information

Course Instructor: Shamim Abdullah

Course Days: Monday

Office Hours & Location:

After the lecture.

E-mail: [sabdulla@yorku.ca](mailto:sabdulla@yorku.ca)

Course Time: 7:00pm - 10:00pm

Class Location: ACW 008

Course eClass site: <https://eClass.yorku.ca>

### 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](#)).

### Course Overview

### Course Description

Introduces simulation methodology. Focuses on the construction, validation, and application of simulation models aimed at improving decision making in management systems.

## Course Learning Objectives

By the end of this course, students will be able to:

- Understand the basic structure of a system and the behavior it can produce.
- Understand how all the objects in a system interact with one another.
- perform modeling using the simulation software.

## Course Format and Organization

All classes will be held on campus either in the classroom or in the computer lab. During the lecture, material will be covered as described in the course schedule.

## 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.

Office hours will be held after each class.

## Course Evaluation

| Assessment   | Due Date            | Weight %         | Course Learning Outcome  |
|--|---------------------|------------------|--|
| Quiz 1, 2 and 3  | See Course Schedule | 24%<br>[8% each] | Assessment of knowledge pertaining to specific lectures.                             |
| Assignments 1 and 2  | See Course Schedule | 10%<br>[5% each] | Assessment of knowledge pertaining to specific lectures.                             |
| Attendance, Class Participation & Project presentation participation | See Course Schedule | 26%              | Assessment of participation in the class room and in the computer lab.               |
| Final Project Submission and Presentation                            | See Course Schedule | 40%              | Assessment of knowledge pertaining to specific lectures and modeling using software. |
|  |                     | <b>100%</b>      |  |

## Technical Requirements/restrictions

- Students are required to have access to a non-programmable calculator.
- **When class sessions are conducted in person, the use of electronic gadgets such as laptops/notebooks/tablets, smart phones, or cell phones is NOT allowed in the classroom. However, in the Computer Lab you will get access to the simulation software on individual desktop computer.**
- Please keep your electronic gadgets in your bag, they should not be on your desk.
- If there is anything urgent requiring your attention, you may leave the classroom quietly, without disturbing your classmates, and use your gadget outside.
- No excuses (e.g., use of e-book, use of slides or taking notes directly on the gadget) will be accepted.

## Assignments

1. Assignments must include a cover sheet signed by student/s. Assignments that do not include the signed cover sheet will not be accepted. The cover sheet will be provided. Cheating will result in zero for all involved students and necessary disciplinary measures outlined in the Senate Policy on Academic Honesty will be applied.
2. Please be advised that Assignments are due on the day and time designated at the **BEGINNING** of classes. Late Assignments will **NOT** be accepted, and no extensions will be granted.
3. **Assignments must be TYPED, if you need to draw graph, chart, diagram it must be done by using computer. Handwritten/drawn part of Assignments will NOT be considered for marking.**
4. No Penalty for early submission, for some reason if you are unable to attend lecture of the day Assignments are due, you can submit your work earlier (till 4 pm of the due date) to room 282, Atkinson building in my attention and must send me email after submission.
5. **EMAIL HAND-IN WILL NOT BE ACCEPTED.**  
**LATE or NON-TYPED Assignments will NOT be accepted under any circumstance.**
6. **Make sure to sign the Assignment Submission sheet after submission of Assignments.**

## General Course Policy

1. **WARNING:** Distribution or uploading of course content is STRICTLY PROHIBITED. All material is copyright protected.
2. Attendance will be taken daily throughout the semester.
3. The Quizzes will be held on campus at the same time for all students.
4. Information concerning the Final Project will be posted on the course website.
5. If you must miss a class, it is suggested that you try to obtain any missed notes from a classmate. **NOT all class material will be available online**. Please note that you are responsible for everything discussed in class (whether mentioned/included in the textbook or not).
6. **You are NOT allowed to take pictures or record any content of the lecture.**
7. Concerns regarding marks **will not be accepted after a week** from the releasing of the marks.
8. Due to unavoidable circumstances if any lecture missed, date for make-up lecture will be announced on course web site.
9. In case of a fire alarm, students are to get up instantly, collect their personal belongings and leave the building. (You should not wait until a professor, or an invigilator tells them to do so.)
10. Students will not be allowed to write quizzes or submit assignments, and final project unless they are on the class list / sign in sheet. There will be no exceptions. It is the student's responsibility to ensure that they are properly enrolled.
11. **Missed Quizzes, Assignments and Attendances/participation** - There will be no deferrals.
12. The Final course 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.
13. Marks for quizzes and assignments will be posted on eClass or an alternative site at the discretion of each instructor.
14. You can request your quizzes or assignments to be re-appraised. However, note that the whole testing component, not just the part under question, will be re-assessed. Three outcomes are possible, your mark might stay the same; increase; or decrease. This will not be permitted after 1 week from when they are returned. If assignment is completed in group, then all members of the group should request for the re-appraisal.
15. Accommodations must be provided within the first 2 weeks of class and arrangements made with the alternative exam center directly by students.

**Missed Quizzes and Assignments - See above.**

### **Quizzes/Assignments**

Quizzes are closed book and notes.

**Answers for Multiple Choice and True/False Questions must be recorded on the provided sheet or SCANTRON sheet by pencil within the designated time of the testing components. NO EXTRA time will be granted to “bubble in” the Scantrons. No Excuses (e.g., “I answered all questions. Just need to transfer to Scantron.”) will be accepted.**

It is your responsibility to correctly bubble on Scantron the quiz/exam version under “Test Form”. Quizzes and Assignments will not be returned to the students, you will get your marks. However, you can review on individual basis during office hours. To review you must submit your request via email within five days from the release date. When reviewing you are not allowed to take notes, pictures or copy any part of the testing instrument.

### **Attendance**

Attendance will be taken daily.

### **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](#).

## **Course Schedule: Weekly Readings and Activities**

### **Required Course Materials**

"Business Dynamics: Systems Thinking and Modeling for a Complex World",  
(John D. Sterman), McGraw Hill, 2000.

- Supporting/Additional material (if any) details will be discussed in class.
- Photocopying more than 10% of copyrighted material is illegal and may involve penalties.
- Do not duplicate textbook, course kits or any copyrighted material used in this course or obtain photocopies.

## Course Schedule

Note that the course schedule below is subject to change as deemed appropriate/ necessary by the Professor during the semester.

| Lecture  | Date          | Topic/s   | Quiz/Chapters   |
|--|---------------|---|---|
| 1  | Jan 8         | <b>System Dynamics Modeling Process</b><br>Problem Identification and Data collection<br>Perspective and Process                  | Chapters (1-4)  |
| 2  | Jan 15        | Perspective and Process (Contd...)  | Chapters (1-4)  |
| 3  | Jan 22        | Causal Loop Diagrams  | Chapter 5   |
| 4  | Jan 29        | Stocks and Flows<br>Understanding of modeling Software  | Chapter 6<br><b>Quiz - 1</b>                          |
| 5  | Feb 5         | Understanding of modeling Software  | Power Sim Software                                    |
| 6  | Feb 12        | Dynamics of Stocks and Flows<br>Dynamics of Simple Structures<br>Understanding of modeling Software                               | Chapter 7<br>Chapter 8                                |
|  | <b>Feb 19</b> | <b>No-Class: Reading Week</b>   |   |
| 7  | Feb 26        | Essentials of Continuous Simulation<br>Modeling, Delays<br>Numerical Integration Techniques<br>Understanding of modeling Software | Chapter 11<br>Appendix - A                            |
| 8  | Mar 4         | Dealing with S-shaped Growth  | Chapter 9<br><b>Quiz - 2</b><br><b>Assignment - 1</b> |
| 9  | Mar 11        | Path Dependence and Positive Feedback<br>Modeling the Dynamics of Supply Chain<br>Management                                      | Chapter 10<br>Chapter 18                              |
| 10   | Mar 18        | Model Testing<br>Validation and Model Testing in Action   | Chapter 21  |
| 11   | Mar 25        | Project Presentation – Session 1  | <b>Quiz - 3</b><br><b>Assignment - 2</b>              |
| 12   | Apr 1         | Project Presentation – Session 2  |   |
| April 10 - Project Submission Due Date →[Details: TBA] |               |   |   |

Quizzes will be held at the beginning of the class.

What sessions will be held in the Computer Lab, it will be announced in the class.

## Course Policies

All students are expected to familiarize themselves with the following information:

- [Common University and Course Policies](#) (deferred exams, 20% rule, etc)
- [Student Rights & Responsibilities](#)
- [Academic Accommodation for Students with Disabilities](#)
- [University and School Policies](#)

**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.

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.

In this course, we strive to maintain academic honesty to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing [SPARK's Academic Integrity module](#) at the beginning of the course. Breaches of academic honesty range from cheating to plagiarism (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.). All instances of academic dishonesty in this course will be reported to the appropriate University authorities and can be punishable according to the [Senate Policy on Academic Honesty](#).

### **Generative Artificial Intelligence Usage Policy**

Students are not permitted to use generative artificial intelligence (AI) in this course. Submitting any work created through the use of generative AI tools will be considered a violation of York University's [Senate Policy on Academic Honesty](#). If you do not know whether an online resource or tool can be used in this course, please contact your instructor for guidance. For more information, please review [AI Technology & Academic Integrity: Information for Students](#).

### **Deferred Standing**

Deferred standing may be granted to students who are unable to write their FINAL examination at the scheduled time (due to illness or other extenuating circumstances) or who are unable to submit their outstanding course work by the end of the term.

Deferred standing requests for ADMS and DEMS courses should follow the [procedure and registration](#) outlined on the School's online registration system. The system will issue a ticket number.



Requests should be emailed to the main office of the School of Administrative Studies ([apsas@yorku.ca](mailto:apsas@yorku.ca)) no later than seven (7) days from date of the final exam (or from the last date to submit term course work, for any request to defer a component other than the final exam). Requests should include your **ticket number** as issued by the online registration system, a completed **Deferred Standing Agreement form** (DSA) and relevant supporting documentation. *Note: As communicated on March 13, 2020, Senate Executive has waived until further notice the requirement for students to submit an Attending Physician's Statement in support of a request for deferred standing or petitions.*

Requests will be considered on their merit and decisions will be made on a case-by-case basis. Decisions will be made available on the online portal. No individualized communication will be sent by the school to students (no letter or e-mails).

### **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 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](#), the [Student Conduct and Responsibilities](#), and 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 [Guide to Netiquette](#) and [Student Guide to eLearning](#).

## **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 of Information 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.

### **Health and Safety**

All York students and instructors share responsibility for the safety and well-being of the community while on York's campuses. Please continue to check [YUBetter Together](#) for the latest information on health and safety.

## 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](#).