Toronto Metropolitan University

The Chang School of Continuing Education

TED ROGERS SCHOOL Information Technology Management

(C)ITM 107 – Mathematics for Business Technology Management

COURSE OUTLINE FOR 2025-2026

Antirequisite(s): QMS 110, QMS 130

Faculty/Contract Lecturer Information

- **Faculty/Contract Lecturer Name:**
- **Office Location:**
- **Office Hours:**
- **Phone:** (416) 979 – 5000, ext.
- **Course Website:** my.torontomu.ca (for courses using D2L)
- **Email Address:** youremail@torontomu.ca

Email Policy

Students are expected to monitor and retrieve messages and information sent through D2L and TMU email on a frequent and consistent basis. In accordance with the Policy on TMU Student E-mail Accounts (Policy 157), Toronto Metropolitan University (TMU) requires that any electronic communication by students to TMU faculty or staff be sent from their official university email account. Communications sent from other accounts may be disregarded.

Course Description

The course emphasizes how to apply various mathematical techniques in the support of managerial decisions in the various functional areas of business. It is subdivided into three major parts: part one covers the study of linear phenomena, including linear functions, matrices, systems of linear equations, linear inequalities, and linear programming; part two covers non-linear phenomena and focuses mainly on quadratic, exponential, and logarithmic functions; and part three examines probability concepts including uncertainties, conditional probability, and Bayes' formula.

Course Details

Teaching Methods

If you are registered in an in-person or a virtual classroom, instruction will take place at scheduled hours, following the approach outlined in D2L Brightspace. If you are registered in a Chang School Distance Education course, please follow the schedule, course outline and learning modules as outlined in D2L Brightspace.

Note: All assessments in this course, regardless of its delivery format, will be held in-person on campus. This applies to in-person, virtual, and online courses, including sections/courses delivered through the Chang School.

Course Materials

Textbook and Other Learning Materials:

The textbook we will use for this course will be online. No physical hard copies will be required. Students need to use the following information to purchase access to the textbook material at the bookstore:

WebAssign Instant Access for Harshbarger/Reynolds' Mathematical Applications for the Management, Life, and Social Sciences, Multi-Term – 9781337630559**.**
Price: $111.95

Course Learning Outcomes

The course emphasizes how to apply various mathematical techniques in the support of managerial decisions in the various functional areas of business. Review of basic algebra (including linear, quadratic and other functions), matrices, systems of linear equations, inequalities and linear programming, exponential and logarithmic functions, and probability concepts, and basic concepts of differential calculus. Topics covered include:

1. Understand the “set” concept and set operations
2. Analyze the relationship between two or more variables
3. Matrices, operations on matrices
4. Solve systems of linear equations
5. Model inequalities, build two-dimensional linear optimization models
6. Common non-linear functions such as exponential and logarithmic functions
7. Understand random events and calculate their probabilities
8. Basic concepts of differential calculus and understand the situations where the rate of change of a function is changing.

Academic Integrity

Academic integrity is integral to your learning, the credibility of your degree or certification, and the integrity of the university as a whole. Senate Policy 60: Academic Integrity defines academic misconduct, provides a non-exhaustive list of examples of behaviours that may be considered as academic misconduct, and explains how academic misconduct concerns are evaluated and decided. The entirety of the policy applies in this course. As well, please note that submitting work created in whole or in part by artificial intelligence tools unless expressly permitted by the faculty/contract lecturer, is considered a violation of Policy 60.

Generative AI Course Policy

Use of Generative AI (e.g. ChatGPT, Grammarly, Perplexity, DeepL Translator) to develop or assist with any ideas or material submitted for coursework is expressly prohibited in this course. Use of Generative AI in this manner will be considered a breach of Policy 60.

Copyright

The course materials provided to you are copyrighted, and may not be shared without my express written permission. Do not share these materials (e.g. course outline, lecture slides, assignment instructions) with others and do not post them on the internet during the course, or at any time after. If you do so, Policy 60 will apply.

Academic Integrity Resources

To learn more about Policy 60 and how to avoid academic misconduct, please review and take advantage of these resources:

- Policy 60: Academic Integrity: www.torontomu.ca/senate/policies/academic-integrity-policy-60/
- Academic Integrity Office website: www.torontomu.ca/academicintegrity
- “Academic Integrity in Space” game: https://games.de.torontomu.ca/aio/#/
- “Academic Integrity in Cyberspace!” game: https://www.torontomu.ca/aic/#/
- Student Life and Learning Support: www.torontomu.ca/student-life-and-learning/learning-support

Topics and Course Schedule

Week	Topic	Readings
1	**Sets and Set Operations** By the end of this lecture, you should be able to: • Use sets and set operations in modelling various logical statements	Section 0.1
2	**Functions and Quadratic Functions** By the end of this lecture, you should be able to: - Represent relationships between two or more variables, using the concepts of sets and functions - Model, describe and graph linear relationships using the concepts of slopes and intercepts. - Analyze phenomena governed by quadratic expressions, find the vertex, the maximum/minimum, and the intercepts - Solve quadratic equations • Apply quadratic expressions for various business problems, such as finding break- even points and market equilibria	Sections 1.2, 1.3, 2.1, 2.2, and 2.3
3	**Matrices** By the end of this lecture, you should be able to: • Use matrices and carry out algebraic operations on them	Sections 3.1 and 3.2

4	**Matrices (Cont'd)**
	By the end of this lecture, you should be able to:
	- Identify the augmented matrix of a system of linear equations
	- Carry out row operations on an augmented matrix to solve a system of linear equations
	  - in the case where the system is square with a unique solution
	  - in the case where the system is square with non-unique solutions (i.e., either with no solution at all, or with an infinite number of solutions)
	  - in the case where the system is non- square
	• Solve a system of linear equations using matrix inverses
		Sections 3.3 and parts of 3.4

5	**Linear Programming (LP)** By the end of this lecture, you should be able to: - Explain the concept of optimization of a linear expression subject to a set of constraints	Sections 4.1 and 4.2

	- Model linear optimization problems • Solve 2-dimensional linear programming models using graphical/algebraic methods	
6	• **Test – Test grades will be available on D2L on or before Week #8**	
7	**Exponential and Logarithmic Functions** By the end of this lecture, you should be able to: - Define, graph and compare exponential and logarithmic functions to each other and to power functions - Analyze properties of exponential and logarithmic functions • Solve various equations involving exponential and/or logarithmic expressions	Sections 5.1, 5.2, and 5.3
8	**Introduction to Probability** By the end of this lecture, you should be able to: • Model random phenomena and compute the probability of single and multiple events	Sections 7.1 and 7.2
9	**Conditional Probability and Bayes Formula** By the end of this lecture, you should be able to: - Calculate conditional probabilities • Update an estimate of a probability using newly available information	Sections 7.3 and 7.4
10	**Advanced probability concepts** By the end of this lecture, you should be able to: - Use permutations and combinations to solve counting and probability problems • Use transition matrices and steady-state vectors to solve Markov chain problems	Sections 7.5, 7.6, and 7.7
11	**Introduction to Calculus** By the end of this lecture, you should be able to: - Find function (rational, polynomial, and piecewise defined) limits graphically and numerically - Determine continuity, asymptotes, and limits within functions • Find average rates of change, derivatives, slopes of functions and curves	Sections 9.1, 9.2, 9.3
12	• **REVIEW SESSION**	

Evaluation

The grade for this course is composed of the mark received for each of the following components:

Evaluation Component	Due Date	Percentage of Final Grade	Anticipated Return Date
Weekly Assignments (10 assignments worth 1% each)	At the end of each week of the term, except week 6 and week 12	10%	One week after the assignment submission date.
Midterm Exam	Week 6	40%	On or before Week 8
Final Exam	TBA	50%	TBD
Final Grade		100%	
Note: Students must achieve a course grade of at least 50% to pass this course. At least 20% of the grade based on individual work will be returned to students prior to the last date to drop a course in good academic standing. For Fall 2025, this is Friday November 14, 2025. For Winter 2026, this is Friday March 27, 2026.			

University Policies

You are reminded that you are required to adhere to all relevant university policies found in their online course shell in D2L and/or on the Senate website. Please refer to the Course Outline Appendix for more detail.

Important Resources Available at Toronto Metropolitan University

- The University Libraries provide research workshops and individual consultation appointments. There is a drop-in Research Help desk on the second floor of the library, and students can use the Library's virtual research help service to speak with a librarian, or book an appointment to meet in person or online.
- Student Life and Learning Support offers group-based and individual help with writing, math, study skills, and transition support, as well as resources and checklists to support students as online learners.
- You can submit an Academic Consideration Request when an extenuating circumstance has occurred that has significantly impacted your ability to fulfill an academic requirement. You may always visit the Senate website and select the blue radio button on the top right hand side entitled: Academic Consideration Request (ACR) to submit this request.
  For Extenuating Circumstances, Policy 167: Academic Consideration allows for a once per semester ACR request without supporting documentation if the absence is less than 3 days in duration and is not for a final exam/final assessment. Absences more than 3 days in duration and those that involve a final exam/final assessment, always require documentation. Students must notify their faculty/contract lecturer once a request for academic consideration is submitted. See Senate Policy 167: Academic Consideration.
  Longer absences are not addressed through Policy 167 and should be discussed with your Chair/Director/Program to be advised on next steps.
- If taking a remote course, familiarize yourself with the tools you will need to use for remote learning. The Remote Learning Guide for students includes guides to completing quizzes or exams in D2L Brightspace, with or without Respondus LockDown Browser and Monitor, using D2L Brightspace, joining online meetings or lectures, and collaborating with the Google Suite.
- FAQs Academic Considerations and Appeals
- Information on Copyright for Faculty and students.
- Information on Academic Integrity for Faculty and students.

Accessibility

- At Toronto Metropolitan University, we are committed to ensuring that all courses are accessible to everyone and to removing barriers that may prevent some individuals from enrolling in courses.
- All technologies and tools used in this course are accessible.
- Students who discover an accessibility barrier with any of the course materials or technologies should contact their faculty/contract lecturer.
- As outlined in Policy 159: Academic Accommodation of Students with Disabilities, students are required to proactively consult with AAS, the faculty/contract lecturer, Department or Faculty, as soon as feasible, including prior to enrolling in a course or program, on any concerns they may have about their ability to meet the essential academic requirements of a course/program.

Academic Accommodation Support

Academic Accommodation Support (AAS) is the university's disability services office. AAS works directly with incoming and returning students looking for help with their academic accommodations. AAS works with any student who requires academic accommodation regardless of program or course load.

- Learn more about Academic Accommodation Support.
- Learn how to register with AAS.
- Learn about Policy 159: Academic Accommodation of Students with Disabilities

Academic Accommodations (for students with disabilities) and Academic Consideration (for students faced with extenuating circumstances that can include short-term health issues) are governed by two different university policies. Learn more about Academic Accommodations versus Academic Consideration and how to access each.

Wellbeing Support

At Toronto Metropolitan University, we recognize that things can come up throughout the term that may interfere with a student's ability to succeed in their coursework. These circumstances are outside of one's control and can have a serious impact on physical and mental well-being. Seeking help can be a challenge, especially in those times of crisis.

If you are experiencing a mental health crisis, please call 911 and go to the nearest hospital emergency room. You can also access these outside resources at anytime:

- Distress Line: 24/7 line for if you are in crisis, feeling suicidal or in need of emotional support (phone: 416–408–4357)
- Good2Talk: 24/7-hour line for postsecondary students (phone: 1-866-925-5454)
- Keep.meSAFE: 24/7 access to confidential support through counsellors via My SSP app or 1-844-451-9700

If non-crisis support is needed, you can access these campus resources:

- Centre for Student Development and Counselling: 416-979-5195 or email csdc@torontomu.ca
- Consent Comes First – Office of Sexual Violence Support and Education: 416-919-5000 ext 3596 or email osvse@torontomu.ca
- Medical Centre: call (416) 979-5070 to book an appointment

We encourage all Toronto Metropolitan University community members to access available resources to ensure support is reachable. You can find more resources available through the Toronto Metropolitan University's Wellbeing Central website.