Toronto Metropolitan University

The Chang School of Continuing Education

TED ROGERS SCHOOL Information Technology Management

(C)ITM 752 – Data Visualization

COURSE OUTLINE FOR 2026-2027
Semester, Section
Classroom, Class Time

Prerequisite(s): QMS 102 OR QMS 210 or in the Business Technology Management 2-Year Public Ontario College Diploma Graduate - Degree Completion Program
Antirequisite(s): None

Faculty/Contract Lecturer Information

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

Mode of Course Delivery: Online Synchronous

Academic Program Advising Contacts

Chair/Director for this Course: Dr. Sameh Al Natour

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

This course covers the principles of data visualization to create meaningful displays of data and effective presentation of results to engage the audience and facilitate decision making. The course introduces best practices to visualize common data types, charts, and statistical phenomena (e.g., trends, distributions, missing data). Conceptual

discussions will be followed by hands-on labs to teach Tableau: a popular data visualization software. No prior programming or data analytics skills are required.

Course Details

Teaching Methods

This course will be delivered virtually. The instruction will take place **at scheduled hours synchronously via Zoom**, following the approach outlined in D2L Brightspace.

The course will incorporate a combination of a lecture and lab sessions. Regular lectures, prescribed weekly readings, weekly assignments and lab practices are the main teaching activities that occur in this course. The first half of the session will include a lecture on the fundamentals of data visualization theory and basic data exploration techniques followed by a lab hour where students will work on in-class exercises by using Tableau. The instructor will establish an active learning environment by engaging the students in practical assignments through the exchange of relevant questions and ideas. Students should expect frequent and substantive interactions between the instructor and students and among students in every class. Those students that actively participate in the learning process will gradually assume ownership of the knowledge contained in the course materials. In addition to ownership of the course content, the students will master a set of practical and soft skills related to visual communication**.**

Note: All assessments in this course, including the final exam, will be held in-person on campus. **The final exam of this course will be held in-person on campus**.

Course Materials

The course will incorporate several book chapters, scholarly articles, and videos that will be available through D2L Brightspace and TMU library at no cost. You can review resources for using D2L Brightspace. We will also use the textbook by Richardson as listed below. Purchasing the textbook is **required**.

Required Textbook:

Textbook Title: Data Visualization: Storytelling with Impact (ebook, 2026 Release)
Authors: Vernon J. Richardson, Ronald N. Guymon and Joseph Richardson
Publisher: McGraw Hill
ISBN: 9781265476373
Price for 180 days: $76.50
Price for Lifetime: $109.50

Data Visualization Software: TABLEAU

The Tableau software student license will be provided at **no-cost** to all students.

1. Download the latest version of Tableau Desktop here
2. Click on the link above and select "Download Tableau Desktop". On the form, enter your school email address for Business E-mail and enter the name of your school for Organization.
3. Activate with your product key: **The key will be provided on D2L Brightspace.**
4. Already have a copy of Tableau Desktop installed? Update your license in the application: Help menu → Manage Product Keys

To get started use Student Resource Page. You can continue using Tableau after the class is over by individually requesting one-year license through Tableau for Students.

Course Learning Outcomes

This course provides an opportunity for students to explore data visualization by conducting descriptive data analysis and applying data visualization techniques. Emphasis will be on understanding the visual theory to create effective graphs and visual stories. Students will explore various aspects of data visualization through assignments, use of a data visualization software (i.e., Tableau), selected readings, and a group research project.

By the end of the course, students will:

- Develop an understanding of the visual theory and key techniques used in data visualization, including visual perception, cognition, and design.
- Learn effective uses of common charts for presentation and storytelling.
- Gain practical experience building and evaluating data visualization examples, including basic charts and interactive dashboards.
- Conduct exploratory data analysis and apply visual analytics techniques.
- Be exposed to a number of common data domains and corresponding analysis tasks, including multivariate, text, survey, and cartography.

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, and Plagiarism Detection

Students may use Generative AI (e.g. ChatGPT, Grammarly, Perplexity, DeepL Translator) for minor grammar correction. This includes translating individual words and correcting spelling, punctuation and basic grammar issues. AI tools may not be used to make substantial revisions such as edits to style, tone, content nor rewrite phrases. Failure to stay within these limits will be considered a breach of Policy 60.

Students may use Generative AI (e.g. ChatGPT, Grammarly, Perplexity) for ideation and brainstorming but not for research or for writing anything that will be submitted for credit. Failure to stay within these limits will be considered a breach of Policy 60. Students are required to write a clear declarative statement describing how AI tools were used and the extent of its contribution to the final submission.

Guidance on Smart Glasses and Academic Integrity: Smart glasses are wireless communication devices and aren't authorized for use during tests or exams. Like smart phones and smart watches, smart glasses must not be on your desk or your person and must be put away in your bag or under your seat.

Turnitin or another originality detection software

Turnitin is a plagiarism prevention and detection service to which TMU subscribes. It is a tool to assist faculty/contract lecturers in determining the similarity between students' work and the work of other students who have submitted papers to the site (at any university), internet sources, and a wide range of books, journals and other publications. While it does not contain all possible sources, it gives faculty/contract lecturers some assurance that students' work is their own. No decisions are made by the service; it generates an "originality report," which faculty/contract lecturers must evaluate to judge if something is plagiarized.

Students agree by taking this course that their written work will be subject to submission for textual similarity review to Turnitin. We strongly recommend that faculty/contract lecturers can opt to have student's papers included in TMU's institutional repository rather than the default Turnitin repository. Use of the Turnitin service is subject to the terms-of-use agreement posted on the Turnitin website. Students who do not want their work submitted to this plagiarism detection service must, by the end of the second week of class, consult with their faculty/contract lecturer to make alternate arrangements. Students who choose not to have their papers screened for textual similarity review by turnitin may be required to submit additional work with their research essay. For example:

- an annotated bibliography of each source used in your paper; and/or
- the first few pages of each cited source used in your paper

Even when a faculty/contract lecturer has not indicated that a plagiarism detection service will be used, or when a student has opted out of the plagiarism detection service, if the faculty/contract lecturer has reason to suspect that an individual piece of work has been plagiarized, the faculty/contract lecturer is permitted to submit that work in a non-identifying way to Turnitin.

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

If you are a student registered with Academic Accommodation Support (AAS):
Please inform your faculty/contract lecturer if you have test accommodation needs that include the use of assistive technology (including text-to-speech, dictation, or literacy software). Some software may require additional configurations by the faculty/contract lecturer, so it is important you inform them in advance and leverage the sample quiz to ensure the tools are compatible with the Brightspace Quiz in LockDown Browser.

However, not all Assistive Technology tools approved by AAS work well with Respondus' software; if your experience of the sample quiz does not function as expected, please notify your faculty/contract lecturer and/or Accommodation Facilitator.

Topics and Course Schedule

Week	Topic & Learning Outcomes	Activities/ Readings
1	**Addressing Business Questions with Data Visualization** • Define data visualization and discuss why we visualize data • Discuss its history, importance, and applications • Discuss the importance of asking the right questions to create effective visualizations supporting your data story. • Understand course objectives and requirements **Before Class:** Read **Textbook Chp 1** and class content on D2L **After Class:** Install Tableau	Install Tableau
2	**Master the Data: Data Qualities and Types** • Discuss the importance of asking the right questions to create effective visualizations supporting your data story. **Before Class:** Read **Textbook Chp 2** and class content on D2L	
3	**Perform the Analysis: Descriptive Analytics** • Discuss the use of visualizations for data exploration, descriptive and diagnostic analysis • Understand how to choose the right chart types that may effectively present the data relationships. • Explain the fundamental concepts in Tableau, including: dimensions, measures, hierarchies, sorting, formatting. • Analyze Super Store data set to create basic chart types, including: bar and line graphs. **Before Class:** Read **Textbook Chp 4** and class content on D2L **After class:** Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	**Lab 1:** Implementing Basic Graphs I
4	**Data Visualization Design Principles** • Explain the fundamentals of effective visual encoding. • Discuss the effectiveness of visual channels and human capacity for pre-attentive processing. • Explain the fundamentals of effective use of colors. • Discuss theories on visual design, including Gestalt Principles, Channel Effectiveness, Visual Salience, and Layering. • Analyze Super Store data set to create advanced chart types, including heat map, tree map, scatter plot, stacked area. **Before Class:** Read **Textbook Chp 3** and class content on D2L **After class:** Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	**Lab 2:** Implementing Basic Graphs II
5	**Perform the Analysis: Predictive Analytics** • Introducing techniques for predictive data analysis • Explain the concepts of filters and calculations. • Analyze Super Store data set to utilize filters and calculations. **Before Class:** Read **Textbook Chp 5** and class content on D2L	**Lab 3:** Understanding Filters and Calculations

	After class: Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	
	Study Week	***Project Proposal***
6	**Visualizing Distributions** • Understand effective chart types to visualize distributions. • Explain the concept of parameters in Tableau. • Analyze Super Store data set to utilize parameters. **Before Class:** Read class content on D2L **After class:** Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	**Lab 4:** Distributions and Parameters
7	**Visualizing Relationships** • Understand effective chart types to visualize relationships. • Explain the concepts of sets and grouping in Tableau. • Analyze Super Store data set to utilize groups and sets. **Before Class:** Read class content on D2L **After class:** Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	**Lab 5:** Relationships and Sets
8	**Visualizing Maps** • Understand the use of maps to visualize data. • Explain the concept of LOD Expressions in Tableau. • Analyze Super Store data set to utilize LOD. **Before Class:** Read class content on D2L **After class:** Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	**Lab 6:** Maps and LOD Expressions
9	**Share the Story: Storytelling and Dashboard Design** • Learn the techniques for effective storytelling and persuasion. • Understand applications of dashboard and storyboard design. • Create dashboards and storyboards in Tableau. **Before Class:** Read **Textbook 6 & 7** and class content on D2L **After class:** Submit class and lab work document to D2L **Due:** Next day by 5:00pm.	**Lab 7:** Interactive Dashboards
10	**Ethical Visualizations** • Learn Tufte's guiding design principles for effective data visualization. • Develop an understanding of common pitfalls and ethics. **Before Class:** Read **Textbook Chp 8** and class content on D2L	***Group Project & Report***
11	**Group Project Presentations**	
12	**Review: Group Projects, Final Exam**	

Evaluation

The grade for this course is composed of the mark received for each of the following components. Schedule of all assignments can be found under Course Schedule table.

Evaluation Component	Due Date	Percentage of Final Grade	Anticipated Return Date
Weekly Class Work and Labs • Labs & reflections • Visual critique discussions	Every Class	30%	Within a week
Group Project • Project Proposal • Project Report • Presentation	• Week 6 • Week 10 • Week 11	30%	Within two weeks
Final Exam	TBD	40%	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 2026 this must be before Friday, November 20, 2026 and for Winter 2027 before Friday, April 2, 2027.			

Weekly Class Work and Labs: Each session will include assigned readings that will serve as the foundation for class discussions. Given the interactive nature of the class and the use of active learning methods, attendance and active participation in class activities are both important and required. To support your learning, each session will include participatory class work and lab exercises using Tableau. At the end of each session, students are required to submit their individual class and lab work on D2L. A total of **6 out of 7 submissions** are expected throughout the semester. **Late submissions will not be accepted**.

Group Projects: Students will work in groups of 5–6. Each group will complete one project consisting of a proposal (5%), a Tableau dashboard and project report (20%), and a brief in-class presentation (5%).

Final Exam: Students will take an **in-person final exam** at the end of the semester. The final exam will provide an individualized opportunity to demonstrate an understanding of the concepts, principles, recommendations, and tools that are central to data visualization and their applications in real-world scenarios. The exams will include multiple-choice and short essay questions to reflect on the principles of effective data visualization and critique.

University Policies

Students must be reminded that they are required to adhere to all relevant university policies found in their online course shell in D2L and/or on the Senate website.

Important Resources Available at Toronto Metropolitan University

- **Addressing Academic Concerns**: Students are expected to address any questions or concerns through open and timely communication with the course faculty/contract lecturer, as soon as they arise. If a concern cannot be resolved through this initial communication or if additional support is required, students are encouraged to reach out to their program advisor or the chair/director of the teaching department for further guidance. These individuals can help provide clarity, facilitate next steps, and ensure that matters are reviewed in a fair and appropriate manner.

- 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.

- FAQs Academic Considerations and Appeals
- Information on Copyright:
    - Copyright FAQs for Faculty/Contract Lecturers
    - Copyright FAQs for Students
- Information on Academic Integrity:
    - Academic Integrity for Faculty/Contract Lecturers
    - Academic Integrity for 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 accessibility services office, supporting students with disabilities. AAS works with students, faculty, and staff to create inclusive learning environments, reduce barriers, and promote accessibility across the university.

If you have (or suspect you may have) a disability, AAS can provide consultation, guide you through registration, develop accommodation plans where appropriate, and connect you with supports and services. For information about eligibility, documentation requirements, registration, deadlines, and available services, visit AAS.

Academic Accommodations (for students with disabilities) and Academic Consideration (for short-term extenuating circumstances) are governed by **different university policies**. Learn more about each process and how to access support. Students registered with AAS may request academic consideration (related or unrelated to their

disability) if they experience extenuating circumstances that impact their ability to meet their shorter term academic obligations. This includes short term physical or mental health issues that are sudden/acute (e.g, the flu), unexpected illness or injury, hospitalization or treatment, and significant aggravation of a pre-existing condition. Please see Policy 167: Academic Consideration for more information and details.

Please note that there is no accommodation for missing/rescheduling or reweighting of tests - this is considered an alternate arrangement. Any student who misses a test/exam will be directed to submit an ACR to explore if possible alternate arrangements under Policy 167: Academic Consideration can apply .

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)
- **GuardMe Student Support Program (GMSSP):** 24/7 access to confidential support through counsellors via the Student Support 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.