

(C)ITM 711 – Cloud Computing

COURSE OUTLINE FOR 2026-2027

Semester, Section
Classroom, Class Time

Prerequisite(s): ITM 301

Antirequisite(s): None

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

Mode of Course Delivery: [In-Person](#)

[Academic Program Advising Contacts](#)

Chair/Director for this Course: 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 will provide a comprehensive coverage on the concepts, architectures and technologies of cloud computing from a business perspective. It provides a deep-down analysis of architectures and mechanisms that capture the real-world of cloud platforms. It dives into all of the details that organizations need to know in order to plan for developing applications on cloud and what to look for when using applications or services hosted on a cloud.

Course Details

Teaching Methods

Lectures, Interactive Exercises, and Group Presentations.

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.

Variations within a Course

Variations between sections will include differences in numerical content of assignment questions.

Course Materials

Textbook and Other Learning Materials:

Textbook:

Title: Cloud Computing: Concepts, Technology & Architecture (1st Edition)

Authors: Thomas Erl, Ricardo Puttini and Zaigham Mahmood

Publisher: Prentice

ISBN: 9780133387520

Price: \$48.49

Lecturer Notes: NO Cost

Course Learning Outcomes

The objective of this course is to provide students with an opportunity to keep abreast of new topics of importance as they emerge in the field. Topics will vary from year to year and will be announced. Method of instruction will vary depending upon the topics offered. This course will provide a comprehensive coverage on the concepts, architectures, and technologies of cloud computing and its business perspective. It provides a deep-down analysis of architectures, mechanisms that capture the real-world cloud platforms. It dives into all of the details that an organization need to know in order

to plan for developing applications on cloud and what to look for when using applications or services hosted on a cloud. It also prepares the students for organizational roles that require interaction with external vendors of cloud services.

Upon completion of the course, students will be able to:

- Articulate the key concepts, technologies, strengths, and limitations of cloud computing.
- Explain the benefits, risks, and challenges of using cloud services as an IT strategy.
- Characterize different cloud computing models and describe different architecture models of cloud computing.
- Analyze and evaluate cloud computing solutions and recommend an appropriate solution according to the applications used.
- Explain the realization mechanisms of cloud technologies

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, Plagiarism Detection, and Virtual Proctoring

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.

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.

Virtual Proctoring Information

In-Person online exam(s) within this course use a virtual proctoring system. Please note that your completion of the exam will be recorded via the virtual platform and subsequently reviewed by your faculty/contract lecturer. The virtual proctoring system provides recording of flags where possible indications of suspicious behaviour are identified only. Recordings will be held for a limited period of time in order to ensure academic integrity is maintained.

Respondus Lockdown Browser with Monitor is currently the only virtual proctoring solution covered by [Policy 135: Final Examinations Policy](#). Access to a device that can support the virtual proctoring tools is your responsibility as a student; the [Student Respondus Guide](#) identifies current technical requirements, as well as additional considerations for your use including data privacy, accessibility, and how to prepare.

Please note that you will be required to show your TMU OneCard prior to beginning to write the exam. Should a student not have a OneCard, government issued ID can be displayed to the camera, showing only the picture and name (all other information can be covered by the student).

Information will be provided prior to the exam date by your faculty/contract lecturer who may provide an opportunity to test your set-up or provide additional information about online proctoring. Since videos of you and your environment will be recorded while writing the exam, please consider preparing the background (room/walls) so that personal details are not visible, or move to a room that you are comfortable showing on camera.

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.

Digital Learning Tools used in this course

Akindi for assessments, Mentimeter for interactive exercises, PowerPoint/Google Present for Group Presentations. NO cost to students.

Topics and Course Schedule

Week	Date	Topic & Learning Outcomes	Readings
1	September 8-9	Introduction to Cloud Computing - <i>Basic concepts, goals and benefits, risk, and challenges</i> - Understand virtualization - Describe the advantages and disadvantages of cloud computing - Realize threats on data hosted on cloud	Chapters 1, 2, 3 Lecture notes
		Fundamental Models – <i>Delivery models, deployment models</i> - Understand the architectures of delivery models Infrastructure-as- a-Service (IaaS), Platform-as- a-Service (PaaS) and Software-as- a-Service (SaaS) - Differentiate between Public cloud, Community cloud, Private cloud, and Hybrid cloud	Chapters 4, 14 Lecture notes
2	September 15-16	Cost and Pricing – <i>Business cost, usage cost, cost management</i> - Distinguish cost model, upfront cost, and recurring cost - Logging usage of cloud resources - Understand bill management	Chapters 14, 15 Lecture notes
3	September 22-23	Service Quality Metrics and SLA – <i>Availability, reliability, performance, scalability, resilience</i> - Identify and describe the parameters for quality of service (QoS) - Optimize QoS	Chapter 16 Lecture notes
4	September 29-30	Cloud-Enabling Technologies – <i>Data center technology, virtualization technology</i> - Distinguish types of hypervisors for virtualization - Understand Data Center Technology- self-configuration, recovery, Remote Operation, Management and High Availability - Describe Multitenant Technology - Describe Service Technology	Chapter 5 Lecture notes
		Cloud Infrastructure Mechanisms – <i>Logical network, virtual server, cloud storage</i> - Understand storage array and hot-swapping - Describe storage virtualization, fast data replication, SAN, and NAS Explore preconfigured virtual server, on-demand virtual server	Chapter 7 Lecture notes
5	October 06-07	Exam-1 (In-person and In-class)	
	October 13-14	NO CLASS (Study week)	

Week	Date	Topic & Learning Outcomes	Readings
6	October 20-21	Cloud Management Mechanisms – Resource, SLA, and billing management systems • Benefits of Remote Administration • Describe Resource Management mechanism • Understand SLA Management mechanism • Understand Billing Management	Chapter 9 Lecture notes
7	October 27-28	Cloud Security Mechanisms – Cloud-based security, hardened virtual server, secure communication channel • Distinguish between Encryption, Hashing, and Digital Signature -Select appropriate security measure based on scenario Differentiate between private key encryption and public key encryption	Chapter 10 Lecture notes
8	November 03-04	Cloud Computing Architectures – Distributed architecture, resource management, load balancing, redundancy, failure recovery • Describes cloud architectural models • Understand workload -Distribution Architecture • Understand Resource Pooling Architecture • Describe Scalability Architecture -Explain Elastic Resource • Understand Load Balancing Architecture • Explore Redundant Storage Technology Describe Recovery Technology	Chapters 11, 12 Lecture notes
9	November 10-11	Specialized Cloud Mechanisms – SLA monitor, pay—per-use monitor, audit monitor • Comprehend Service Level Agreement • Understand monitoring techniques	Chapter 13 Lecture notes
10	November 17-18	Cloud Migration Strategies Comprehend the issues in and aspects of cloud migration • Software Development Paradigms • Cloud Migration Phases • Cloud Migration Strategies Cloud Migration Use Cases	Lecture Notes
11	November 24-25	Exam-2 (In-person and In-class)	
12	December 01-02	Special Topics in Cloud Computing Comprehend the latest Trends in and Aspects of Cloud Computing Course Conclusion	Lecture Notes

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
Labs and Assignments	Weeks 3, 4, 9, 11 & 12	40%	Week 6, 10 & 12
Exam-1	Week 5	30%	Week 7
Exam-2	Week 11	30%	Week 12
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.

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.