

## C)ITM 711– Cloud Computing

### COURSE OUTLINE FOR 2025-2026

Prerequisite(s):(C)ITM 301

#### Faculty/Contract Lecturer Information

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- **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

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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

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### 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:

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

**Authors:** Thomas Erl, Ricardo Puttini and Zaigham Mahmood

**Publisher:** Prentice

**ISBN:** 9780133387520

**Price:** \$48.49

### 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 mechanism 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. Instructors can opt to have student's papers included in the Turnitin database or not. 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 an 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 any plagiarism detection service.

## 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/](http://www.torontomu.ca/senate/policies/academic-integrity-policy-60/)
- Academic Integrity Office website: [www.torontomu.ca/academicintegrity](http://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](http://www.torontomu.ca/student-life-and-learning/learning-support)

## Topics and Course Schedule

Week	Topic & Learning Outcomes	Readings	Assignments/Labs
1	<b>Introduction to Cloud Computing - Basic concepts, goals and benefits, risk, and challenges</b> <ul style="list-style-type: none"> <li>Understand virtualization</li> <li>Describe the advantages and disadvantages of cloud computing</li> <li>Realize threats on data hosted on cloud</li> </ul>	Chapters 2, 3 Lecture notes	Vendor products, services and technologies
	<b>Fundamental Models – Delivery models, deployment models</b> <ul style="list-style-type: none"> <li>Understand the architectures of delivery models Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS)</li> <li>Differentiate between Public cloud, Community cloud, Private cloud, and Hybrid cloud</li> </ul>	Chapters 4, 14 Lecture notes	<b>Assignment #01</b> (D2L)
2	<b>Cost and Pricing– Business cost, usage cost, cost management</b> <ul style="list-style-type: none"> <li>Distinguish cost model, upfront cost, and recurring cost</li> <li>Logging usage of cloud resources</li> <li>Understand bill management</li> </ul>	Chapters 14, 15 Lecture notes	<b>Lab #01</b> (/D2L)
3	<b>Service Quality Metrics and SLA – Availability, reliability, performance, scalability, resilience</b> <ul style="list-style-type: none"> <li>Identify and describe the parameters for quality of service (QoS)</li> <li>Optimize QoS</li> </ul>	Chapter 16 Lecture notes	<b>Assignment #02</b> (D2L)
4	<b>Cloud-Enabling Technologies – Data center technology, virtualization technology</b> <ul style="list-style-type: none"> <li>Distinguish types of hypervisors for virtualization</li> <li>Understand Data Center Technology- self-configuration, recovery, Remote Operation, Management and High Availability</li> <li>Describe Multitenant Technology</li> <li>Describe Service Technology</li> </ul>	Chapter 5 Lecture notes	

Week	Topic & Learning Outcomes	Readings	Assignments/Labs
5	<b>Cloud Infrastructure Mechanisms</b> – <i>Logical network, virtual server, cloud storage</i> <ul style="list-style-type: none"> <li>Understand storage array and hot-swapping</li> <li>Describe storage virtualization, fast data replication, SAN, and NAS</li> <li>Explore preconfigured virtual server, on-demand virtual server</li> </ul>	Chapter 9 Lecture notes	
6	<b>Midterm Exam (In-Class)</b>		
7	<b>Cloud Management Mechanisms</b> – <i>Resource, SLA, and billing management systems</i> <ul style="list-style-type: none"> <li>Benefits of Remote Administration</li> <li>Describe Resource Management mechanism</li> <li>Understand SLA Management mechanism</li> <li>Understand Billing Management</li> </ul>		<b>Assignment #03</b> (D2L)
9	<b>Cloud Security Mechanisms</b> – <i>Cloud-based security, hardened virtual server, secure communication channel</i> <ul style="list-style-type: none"> <li>Distinguish between Encryption, Hashing, and Digital Signature -Select appropriate security measure based on scenario</li> <li>Differentiate between private key encryption and public key encryption</li> </ul>	Chapter 10 Lecture notes	<b>Lab #02 (D2L)</b>
10	<b>Cloud Computing Architectures</b> – <i>Distributed architecture, resource management, load balancing, redundancy, failure recovery</i> <ul style="list-style-type: none"> <li>Describes cloud architectural models</li> <li>Understand workload -Distribution Architecture</li> <li>Understand Resource Pooling Architecture</li> <li>Describe Scalability Architecture -Explain Elastic Resource</li> <li>Understand Load Balancing Architecture</li> <li>Explore Redundant Storage Technology</li> <li>Describe Recovery Technology</li> </ul>	Chapters 11, 12 Lecture notes	<b>Assignment #04</b> (D2L)

Week	Topic & Learning Outcomes	Readings	Assignments/Labs
11	<b>Cloud Monitor Mechanisms – SLA monitor, pay—per-use monitor, audit monitor</b> <ul style="list-style-type: none"> <li>Comprehend Service Level Agreement</li> <li>Understand monitoring techniques</li> </ul>	Chapter 8 Lecture notes	
	<b>Special Topics in Cloud Computing</b> <ul style="list-style-type: none"> <li>Comprehend the latest Trends in and Aspects of Cloud Computing</li> </ul>		
	<b>Cloud Migration Strategies</b> <ul style="list-style-type: none"> <li>Comprehend the issues in and aspects of cloud migration</li> </ul>	Lecture Notes	
12	FINAL EXAM: Post-Midterm Content (in-class)		

## 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
<b>Labs and Assignments</b>	Weeks 3, 4, 9 & 11	40%	Week 5 & 12
<b>Midterm Exam</b>	Week 6	30%	Week 9
<b>Final Exam</b>	Week 12	30%	TBD
<b>Final Grade</b>		100%	
<b>Note:</b> 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

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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

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- [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

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- 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

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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](mailto:csdc@torontomu.ca): 416-979-5195 or email [csdc@torontomu.ca](mailto:csdc@torontomu.ca)
- [Consent Comes First – Office of Sexual Violence Support and Education](mailto:osvse@torontomu.ca): 416-919-5000 ext 3596 or email [osvse@torontomu.ca](mailto: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.