

TIMG 5303B Machine Learning for Technology Entrepreneurship Problem-Solving

CRN: 15367 – Winter 2025

Time and Place

Jan 11 – April 12, 2023, Thursdays, 14:35 to 17:25, Nicol Building, Room 4030

Instructor

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Class sessions & course materials

Access to online course sessions, course materials and recorded videos will be provided through the new CU Brightspace system: <https://carleton.ca/brightspace/>. To access Brightspace you should use your CU credentials and select the “TIMG5303B ML for Tech Entrepr Probl Solv (SEM) Winter 2025” course. To join a class session, you need to select *Video Conferencing Links / Zoom*. All recorded sessions should be also found there.

Office hours

The instructor can be reached via email and will be available for online meetings by preliminary arranged appointments.

Calendar description

Application of machine learning tools to co-create solutions to entrepreneurial problems, with an emphasis on unstructured text analytics. Topics include machine learning tools, application of topic modeling and text analytics, generation of practical competitive insights for managers, and analysis of publicly available sources including websites. Prerequisite(s): TIMG 5002.

Target audience

The course is designed for graduate students registered in the MABA option of the Technology Innovation Management (TIM) program. Students in other TIM program options and other programs are welcome to attend this course depending on space availability. However, all students should meet the academic standards of the TIM program. For non-TIM students, a preliminary meeting with the professor will be required before admission to the course is granted.

Paul Menton Centre

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre (PMC) for Students with Disabilities to complete the necessary letters of accommodation. After registering with PMC, make an appointment to meet and discuss your needs with your instructor at least two weeks prior to requiring accommodation for assignments or presentations. This is necessary to ensure sufficient time to make the necessary arrangements.

Objective

- To enable students to acquire the collaborative skills and business analytics expertise needed to co-create solutions for entrepreneurial problems and generate valuable business insights for companies, and organizations supporting local companies and the TIM program ecosystem.
- To acquire proficiency in:
 - applying topic modeling and other text mining machine learning techniques to generate competitive insights from various types of textual data relevant to growth-oriented companies and organizations supporting such companies and their business ecosystems
 - adopt large language models (LLMs) and other Generative AI resources to collect, structure, interpret, and analyze valuable data to develop competitive insights.
- To position the TIMG 5303 course as a Living Lab environment for Ottawa-based entrepreneurial companies dealing with growth, innovation, business analytics, and competitive market differentiation.

Student groups

The class will be split into 10 groups of 7 students each. Each student will work individually and in one of the groups to perform tasks in class, participate in informal group meetings, and contribute to delivering the assignments. Collaboration among group members is part of the group assignments. Leaving and changing groups for any reason will not be tolerated. Once formed, each group should establish a project management structure that will help collaboration between group members and maximize the value of the deliverables. Group members should meet weekly to discuss progress on group assignments and coordinate the next steps in producing the deliverables.

Group work and freeloaders

There will be zero tolerance for freeloaders. By “freeloader” we refer to an individual who takes advantage of team members’ efforts without contributing much to group efforts. Group work is an important component of this course. Group conflicts are to be dealt with within the group in a fair, respectful, and timely manner. In case a non-contributing student is excluded from a group, he/she will need to deliver the assignment individually.

Plagiarism

Plagiarism, including copying and handing in for credit someone else's work, is a serious instructional offense that will not be tolerated. Please refer to the section on instructional offenses in the Graduate Calendar for additional information. A case of plagiarism will be referred to the Chair of the Department and the Carleton University Ethics Committee. The instructor will not deal with the matter directly. The University has clear processes for dealing with students who are suspected of plagiarism.

Software requirements

This course requires that each group member install the Orange Data Mining toolkit, available at <https://orangedatamining.com/>. The course assignments require the additional installation of its text widget (Option -> Add-ons -> Text). The Documentation section on the Orange’s website provides some help and tutorials that can be found here: <https://orangedatamining.com/docs/>. Installing and dealing with any compatibility issues or problems regarding operability is each student’s own responsibility. The instructor does not have resources to help students with their IT problems. Also, spreadsheet software (preferably Excel) is necessary to handle and edit data sets.

Computer programming skills

Computer programming skills are not required in this course but may be highly useful. Any student, and especially those in the MABA option, interested in becoming proficient in data analytics are highly recommended to develop and advance their programming skills. The course website within Brightspace provides a link to a book on text analytics using Python machine-learning solutions.

Using ChatGPT, Perplexity AI, and other Large Language Model (LLM) resources

Students are encouraged to use ChatGPT, Perplexity AI, and other LLM resources. Every use of such resources should be explicitly mentioned including a clear description of the process, prompts, the LLM-based responses, and how they were used in producing course deliverables. ChatGPT, Perplexity AI, and other LLM resources can be used to:

- Improve the language, flow, and content of their course assignments and reports.
- Align parts of an assignment to enhance its consistency and overall logic.
- Acquire and synthesize information.
- Complement machine learning tasks and analyses.
- Eliminate errors in grammar, spelling, and capitalization as well as citations and references.
- Generate ideas, make recommendations, and extract what is most important.

Students are discouraged from using LLM resources to:

- Provide unedited AI-generated output as a solution to assignments and exam questions.
- Produce content for assignments/exams without double-checking citations and references.

Course assignments

1. Assignment # 1 (group assignment, 30%): Using text analytics to develop actionable insights on the adoption of post-quantum cryptographic solutions

Applying topic modeling, large language model engines (e.g. ChatGPT, Perplexity AI, or other), and other relevant text analytics tools on a corpus of articles focusing on the adoption of post-quantum cryptographic solutions to identify insights pertinent to critical infrastructure operators and large multinational enterprises interested in the adoption of such solutions. You will be provided with a corpus of articles focusing on post-quantum cryptography that were identified based on their capacity to contribute to answering the question: “What are the technical, organizational, and financial factors that influence the successful adoption and implementation of post-quantum cryptographic solutions by critical infrastructure operators and large multinational enterprises in the finance, healthcare, telecommunications, energy, cloud computing, and supply chain sectors, and how do these factors impact resilience, scalability, and readiness for future advancements?” Post-quantum cryptography (PQC) is a set of algorithms that can protect against attacks from both classical and quantum computers. PQC is also known as quantum-safe or quantum-resistant cryptography. PQC is a response to the threat that quantum computers will eventually be able to break public key-based cryptography, which is used to protect online communications in all possible business and social contexts. PQC algorithms use mathematical equations that are believed to be too difficult for quantum computers to solve.

The assignment consists of several components:

1A. Create an MS Word document including a list of references for all publications in the corpus provided by the instructor (use the APA reference style: <https://pitt.libguides.com/citationhelp/apa7>). Identify and highlight each paragraph in each publication that could be used to inform the answer to the question: *“What are the technical, organizational, and financial factors that influence the successful adoption and implementation of post-quantum cryptographic solutions by critical infrastructure operators and large multinational enterprises in the finance, healthcare, telecommunications, energy, cloud computing, and supply chain sectors, and how do these factors impact resilience, scalability, and readiness for future advancements?”* Extract the paragraphs, remove unnecessary wording, and build a corpus of clean text paragraphs in the form of a csv file.

1B. Use the Orange Data Mining tool to apply topic modeling on the newly created corpus of text paragraphs. Define an appropriate number of topics and examine the stability and the replicability of the topic modeling results. Use an LLM engine to process/analyze the most representative text paragraphs associated with each topic to provide a suitable topic interpretation that is both concise and meaningful. Summarize the key findings that provide an answer to the question formulated in component 1A.

2. Assignment # 2 (group assignment, 25%): *Create a corpus of text documents corresponding to the website pages of a sample of technology-based companies operating in a specific business domain and apply topic modeling and other text analytics tools to characterize the companies in terms of what they offer, the way they use specific technologies to shape their offers or the things they care to communicate online.*

2A. Select a specific technology-based business domain and create a representative list of companies operating in it. The list should include min 50 companies selected based on a specific criterion, for example – top companies in 2024, best startups to watch in 2025, all the companies that you have found online offering a specific product/service, etc. Use an appropriate software tool to scrape the company websites to create a corpus of text documents corresponding to each of the accessible web pages under the main company URLs. Many previous students have used the FireScrapper (<https://firescraper.com/>). Other examples of such tools are: Examples of web scrapers are:

- <https://webscraper.io/>
- <https://chromewebstore.google.com/detail/nocoding-data-scraper-eas/ojaffphbffmdaicdkahnmihipclmepok?hl=en>

2B. Use the Orange Data Mining tool to identify a set of topics that could characterize the corpus and, respectively, the list of companies. Discuss the stability of the topics and the replicability of the topic modeling results. Apply any other text analytics tools of your choice to post-process the topic modeling results. Identify 3 to 5 companies that could be considered as the most representative exemplars associated with each specific topic. What are the insights that you can develop by analyzing the topic modeling results, the text in the documents associated with the topics, and the online information provided by the exemplar companies? Your analysis should suggest ways of developing insights about some of the key elements of companies’ value propositions: market offer(s), target customers, key

benefits of the market offer(s) to target customers, key differentiation of the offer relative to competitive alternatives, key resources provided by the companies to enable value co-creation with customers, role of AI and other technologies in enhancing customer value, key cost drivers for target customers, etc.

3. Assignment # 3 (group assignment, 25%): Replicate Assignment # 2 by using one single LLM engine. Design and describe a process that could be used by others to examine lists of companies operating in a specific technology-driven domain.

4. Take-home exam (individual assignment, 20%): Will be provided during the last class on April 6.

Student evaluation and assignment grading

Final grade will be assigned using the following mark allocation:

	Assignment	Deliverable	Date	%
1	Using text analytics to develop actionable insights on the adoption of post-quantum cryptographic solutions	<u>1A</u> : See the description of Assignment 1A provided above.	Thursday, Jan 30	10
		<u>1B</u> : See the description of Assignment 1B.	Thursday, Feb 13	20
2	Applying topic modeling to generate business insights by examining the textual information provided on the websites of a sample of companies in a specific business domain	<u>2A</u> : See the description of the Assignment 2A.	Thursday, March 6	10
		<u>2B</u> : See the description of the Assignment 2B.	Thursday, March 20	20
3	Replicate Assignment 2 on another sample of companies by using one LLM engine. Design and describe a process that could be used by others.	See the description of Assignment 3.	Thursday, April 3	25
4	Take-home exam	Will be provided on April 3 at the last class session.	April 26, 2024	15
Total				100

Class schedule

Session #	Date	Topic	Assigned readings & details
1	Thursday, Jan 9: 14:35-17:35	<ul style="list-style-type: none"> Introduction to course objectives Detailed presentation of Assignments Introduction to content analysis and planning the text analytics process 	<ul style="list-style-type: none"> Course outline document The Fundamentals of Content Analysis, Chs. 2 & 3 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>.

		<ul style="list-style-type: none"> Brief introduction to Orange Data Mining tool Student group formation 	<ul style="list-style-type: none"> Students install and try out the Orange Data Mining tool: https://orangedatamining.com/
2	Thursday, Jan 16: 14:35-17:35	<ul style="list-style-type: none"> Text preprocessing Familiarization with Orange Data Mining tool Finalizing student group formation and project assignment 	<ul style="list-style-type: none"> Text Preprocessing, Ch. 4 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Orange Data Mining tool: https://orangedatamining.com/
3	Thursday, Jan 23: 14:35-17:35	<ul style="list-style-type: none"> Term-Document representation Latent semantic analysis Q & A about Assignments # 1 	<ul style="list-style-type: none"> Term-Document Representation, Ch. 5 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Semantic Space Representation and Latent Semantic Analysis, Ch. 6 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Group work on Assignment # 1
4	Thursday, Jan 30: 14:35-17:35	<ul style="list-style-type: none"> Student group presentations of progress with Assignment # 1. Cluster Analysis: Modeling Groups in Text Q & A about Assignment # 1 	<ul style="list-style-type: none"> Delivery of Assignment 1 component 1A Cluster Analysis: Modeling Groups in Text, Ch. 7 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Group work on Assignment # 1
5	Thursday, Feb 6: 14:35-17:35	<ul style="list-style-type: none"> Probabilistic Topic Models 	<ul style="list-style-type: none"> Probabilistic Topic Models, Ch. 8 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Feedback and group work on Assignment # 1
	Thursday, Feb 13: 14:35-17:35	<ul style="list-style-type: none"> Sentiment analysis Group presentations of Assignment 1B results. 	<ul style="list-style-type: none"> Delivery of Assignment 1 component 1B Modeling Text Sentiment, Ch. 10 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>.
6	Thursday, Feb 20	<i>Winter break</i>	
7	Thursday, Feb 27: 14:35-17:35	<ul style="list-style-type: none"> Guest speaker: Dr. Svetlana Kiritchenko, National Research Council, Canada: Sentiment analysis of social media texts Developing marketing insights from text analysis Q&A and group work on Assignment 2 	<ul style="list-style-type: none"> Guest speaker Berger et al. (2022). Marketing insights from text analysis. <i>Marketing Letters</i>, 33, 365–377. Berger et al. (2020). Uniting the Tribes: Using Text for Marketing Insight. <i>Journal of Marketing</i>, 84(1), 1–25. Group work on Assignment 2
8	Thursday, March 6: 14:35-17:35	<ul style="list-style-type: none"> Storytelling Using Text Data Group work on Assignment # 2 	<ul style="list-style-type: none"> Delivery of Assignment 2 component 2A Storytelling Using Text Data, Ch. 11 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Group work on Assignment # 2
9	Thursday, March 13: 14:35-17:35	<ul style="list-style-type: none"> Visualizing Analysis Results Group work on Assignment 2 	<ul style="list-style-type: none"> Visualizing Analysis Results, Ch. 12 in: Anandarajan et al. (2019). <i>Practical Text Analytics</i>. Group work on Assignment 2
10	Thursday, March 20: 14:35-17:35	<ul style="list-style-type: none"> Group presentations on Assignment 2 component 2A 	<ul style="list-style-type: none"> Delivery of Assignment 2 component 2B Group work focusing on Assignment 3

		<ul style="list-style-type: none"> • Group work focusing on Assignment 3 	
11	Thursday, March 27: 14:35-17:35	<ul style="list-style-type: none"> • Workshop focusing on the delivery of Assignment # 3 	<ul style="list-style-type: none"> • Interactive discussion and group work
12	Thursday, April 3: 14:35-17:35	<ul style="list-style-type: none"> • Group presentations of Assignment 3 	<ul style="list-style-type: none"> • Delivery of assignment # 3

Take home exam is due before midnight on April 26, 2025.

Main textbook

Anandarajan, M., Hill, C. & Nolan, T. (2019). *Practical Text Analytics - Maximizing the Value of Text Data*, Springer.

Recommended books

Albrecht, J., Ramachandran, S., Winkler, C. (2020). *Blueprints for Text Analytics Using Python*. O'Reilly Media, Inc.

Badhwar, Raj (2021). *The CISO's Next Frontier AI, Post-Quantum Cryptography and Advanced Security Paradigms*. Springer Nature.

Hovy, D. (2020). *Text Analysis in Python for Social Scientists. Discovery and Exploration*. Cambridge University Press.

Isson, J. P. (2018). *Unstructured Data Analytics*, Wiley.

Landauer, T., et al. (2011). *Handbook of Latent Semantic Analysis*, New York: Routledge.

Mehta, P., & Majumder, P. (2019). *From Extractive to Abstractive Summarization: A Journey*. Springer Nature Singapore.

Recommended articles

- Albalawi, R., Yeap. T., & Benyoucef, M. (2020). Using Topic Modeling Methods for Short-Text Data: A Comparative Analysis. *Frontiers in Artificial Intelligence*, 3(42): 1-14. doi: 10.3389/frai.2020.00042.
- Antons, D., Grünwald, E., Cichy, P., & Salge, T. (2020). The application of text mining methods in innovation research: current state, evolution patterns, and development priorities. *R&D Management*, 50(3): 329-351.
- Berger, J., Packard, G., Boghrati, R. et al. (2022). Marketing insights from text analysis. *Marketing Letters*, 33, 365–377: <https://doi.org/10.1007/s11002-022-09635-6>.
- Berger, J., Humphreys, A., Ludwig, S., Moe, W. W., Netzer, O., & Schweidel, D. A. (2020). Uniting the Tribes: Using Text for Marketing Insight. *Journal of Marketing*, 84(1), 1–25: <https://doi.org/10.1177/0022242919873106>.
- Blei, D. (2012). Probabilistic Topic Models. *Communications of the ACM*, 55 (4): 77–84.
- Brookes, G. & McEnery, T. (2019). The utility of topic modelling for discourse studies: A critical evaluation. *Discourse Studies*, 21(1): 3–21.
- Choi, J., Menon, A., & Tabakovic, H. (2021). Using machine learning to revisit the diversification–performance relationship. *Strategic Management Journal*, 2(9), 1632-1661: <https://doi.org/10.1002/smj.3317>.

- Davis, I., Keeling, D., Schreier, P., & William, A. (2007). The McKinsey approach to problem solving. *McKinsey Staff Paper* No. 66, July 2007.
- Evangelopoulos, N. (2013). Latent semantic analysis. *WIREs Cognitive Science*, 4:683–692. doi: 10.1002/wcs.1254.
- Evangelopoulos, N., Zhang, X., & Prybutok, V. (2012). Latent Semantic Analysis: five methodological recommendations. *European Journal of Information Systems*, 21: 70–86.
- Hannigan, T., Haans, R., Vakili, K., Tchalian, H., Glaser, V., Wang, M., Kaplan, S., Jennings, P. (2019). Topic modeling in management research: Rendering new theory from textual data. *Academy of Management Annals*, 13(2): 586–632. <https://doi.org/10.5465/annals.2017.0099>
- Harel, J. (2009). Things You Should Know (from Linear Algebra).
- Jelodar, H., Wang, Y., Yuan, C. *et al.* (2019). Latent Dirichlet allocation (LDA) and topic modeling: models, applications, a survey. *Multimedia Tools and Applications*, 78, 15169–15211: <https://doi.org/10.1007/s11042-018-6894-4>.
- Karl, A., Wisnowski, J & Rushing, W.H. (2015). Practical guide to text mining with topic extraction. *WIREs Computational Statistics*, 7:326–340. doi: 10.1002/wics.1361
- Kolomoyets, Y., & Dickinger, A. (2023). Understanding value perceptions and propositions: A machine learning approach. *Journal of Business Research*, 154, 113355: <https://doi.org/10.1016/j.jbusres.2022.113355>.
- Landauer, T., Foltz, P. & Laham, D. (1998). An introduction to latent semantic analysis. *Discourse Processes*, 25(2-3): 259-284. DOI: 10.1080/01638539809545028.
- Lu, Q. & Chesbrough, H. (2022). Measuring open innovation practices through topic modelling: Revisiting their impact on firm financial performance. *Technovation*, 114, 102434: <https://doi.org/10.1016/j.technovation.2021.102434>.
- Maier, D., Waldherr, A., Miltner, P., Wiedemann, G., Niekler, A., Keinert, A., Pfetsch, B., Heyer, G., Reber, U., Häussler, T., Schmid-Petri, H., & S. Adam. (2018). Applying LDA Topic Modeling in Communication Research: Toward a Valid and Reliable Methodology. *Communication Methods and Measures*, 12(2-3): 93-118, DOI: 10.1080/19312458.2018.1430754.
- Miric, M., Jia, N., & Huang, K. (2022). Using supervised machine learning for large-scale classification in management research: The case for identifying artificial intelligence patents. *Strategic Management Journal*, Online Version of Record before inclusion in an issue: <https://doi.org/10.1002/smj.3441>.
- Reisenbichler, M. & Reutterer, &. (2019). Topic modeling in marketing: recent advances and research opportunities. *Journal of Business Economics*, 89:327–356. <https://doi.org/10.1007/s11573-018-0915-7>
- Rubia, J. *et al.* (2024). A Survey about Post Quantum Cryptography Methods. *EAI Endorsed Transactions on Internet of Things*, Volume 10, 2024, 1-9.
- Silge, Julia. (2020). Package ‘tidytext’: <https://github.com/juliasilge/tidytext>
- Spradlin, Dwayne (2012). Are You Solving the Right Problem? *HBR*, Sept 2012 issue.
- Thomo, T. Latent Semantic Analysis (Tutorial): <https://www.engr.uvic.ca/~seng474/svd.pdf>

- Veeckman, C., D. Schuurman, S. Leminen, & M. Westerlund (2013). Linking Living Lab Characteristics and Their Outcomes: Towards a Conceptual Framework. *Technology Innovation Management Review*, 3(12): 6-15. <http://timreview.ca/article/748>
- Welbers, K., Van Atteveldt, W. & Benoit, K. (2017). Text Analysis in R. *Communication Methods and Measures*, 11(4): 245–265. <https://doi.org/10.1080/19312458.2017.1387238>
- Wedell-Wedellsborg, T. 2017. Are You Solving the Right Problems? *Harvard Business Review*, January-95(1): 76-83: <https://hbr.org/2017/01/are-you-solving-the-right-problems>
- Wedell-Wedellsborg, T. 2016. Reframing the problem (video): <https://www.facebook.com/HBR/videos/10154597616307787>
- Wickham, H. (2014). Tidy Data. *Journal of Statistical Software*, 59(10): 1-23.
- Structural topic modeling: <https://towardsdatascience.com/introduction-to-the-structural-topic-model-stm-34ec4bd5383>
- Topic Modeling for Real Estate Listing Descriptions: <https://www.zillow.com/tech/topic-modeling/>

Links providing info on Post-Quantum Cryptography

- https://en.wikipedia.org/wiki/Post-quantum_cryptography
- <https://www.nokia.com/industries/quantum-safe-networks/#what-are-quantum-safe-networks>
- <https://www.entrust.com/resources/learn/post-quantum-cryptography#:~:text=Also%20known%20as%20%22quantum%2Dresistant,operational%20quantum%20computers%20by%202030.>
- <https://www.rambus.com/blogs/post-quantum-cryptography-pqc-new-algorithms-for-a-new-era/#:~:text=%5BUpdated%20December%207th%2C%202023%5D,protect%20against%20quantum%20computer%20attacks.&text=What%20is%20quantum%20computing?,solutions%20are%20available%20from%20Rambus>

Appendix: ADDITIONAL INFORMATION

Group work

The Sprott School of Business encourages group assignments in the school for several reasons. They provide you with opportunities to develop and enhance interpersonal, communication, leadership, follower-ship and other group skills. Group assignments are also good for learning integrative skills for putting together a complex task. Your professor may assign one or more group tasks/assignments/projects in this course. Before embarking on a specific problem as a group, it is your responsibility to ensure that the problem is meant to be a group assignment and not an individual one.

In accordance with the Carleton University Undergraduate Calendar (p. 34), the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59
A = 85-89	B = 73-76	C = 63-66	D = 53-56
A - = 80-84	B - = 70-72	C - = 60-62	D - = 50-52
F = Below 50			

Grades entered by Registrar:

WDN = Withdrawn from the course

DEF = Deferred

Academic Regulations

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline

Academic Integrity

Violations of academic integrity are a serious academic offence. Violations of academic integrity – presenting another's ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the degree and will not be tolerated. Penalties may include; a grade of Failure on the submitted work and/or course; academic probation; a refusal of permission to continue or to register in a specific degree program; suspension from full-time studies; suspension from all studies at Carleton; expulsion from Carleton, amongst others. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy which is available, along with resources for compliance at: <https://carleton.ca/registrar/academic-integrity/>.

Sprott Student Services

The Sprott student services office, located in 710 Dunton Tower, offers academic advising, study skills advising, and overall academic success support. If you are having a difficult time with this course or others, or just need some guidance on how to successfully complete your Sprott degree, please drop in any weekday between 8:30am and 4:30pm. Our advisors are happy to discuss grades, course selection,

tutoring, concentrations, and will ensure that you get connected with the resources you need to succeed! <http://sprott.carleton.ca/students/undergraduate/learning-support/>

Centre for Student Academic Support

The Centre for Student Academic Support (CSAS) is a centralized collection of learning support services designed to help students achieve their goals and improve their learning both inside and outside the classroom. CSAS offers academic assistance with course content, academic writing and skills development. Visit CSAS on the 4th floor of MacOdrum Library or online at: carleton.ca/csas.

Important Information:

- Students must always retain a hard copy of all work that is submitted.
 - All final grades are subject to the Dean's approval.
 - For us to respond to your emails, we need to see your full name, CU ID, and the email must be written from your valid CARLETON address. Therefore, in order to respond to your inquiries, please send all email from your Carleton CMail account. If you do not have or have yet to activate this account, you may wish to do so by visiting <http://carleton.ca/ccs/students/>
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