Institute for Technology Entrepreneurship and Commercialization

TIMG 5001 Principles of Technology Innovation Management (A)
Winter 2026 (January to April)

Time and place

Mondays 6-9 pm EST

In Person: Nicol Building NI5010
Online: Website for course resources and online participation:
https://brightspace.carleton.ca/d2l/home/368040

Instructor
Professor Nusa Fain
5025 Nicol Building
nusa.fain@carleton.ca

Office hours

The instructor is available by email at any time. Email is the preferred mode of communication.
The instructor will be available for office hours, either on campus or online, by appointment as needed.

Target audience

TIMG 5001 is the first of three required core courses for all Technology Innovation Management (TIM) program graduate students. It provides a common level of knowledge and skills required to complete other TIM courses successfully.

Students registered in all five TIM degree pathways – the Master of Science (MS), the Master of Engineering (MEng), the Master of Entrepreneurship (MEnt), the Master of Applied Business Analytics (MABA), and the Master of Digital Transformation and Entrepreneurship (MDTE) – complete this course in their first term of study.

Calendar description

TIMG 5001 [0.5 credit]
Principles of Technology Innovation Management
Develops a common level of knowledge among students on topics in product and service development,

technology entrepreneurship, and commercialization. These topics are based on literature on project management, leadership, industrial marketing, managerial economics and organizational behavior.

Course Objectives

This course introduces students to scholarly research literature and applied practitioner literature in the field of technology innovation management. We learn about critical topics for technology-based companies competing in the global products and services market. These topics include (i) product and service development and (ii) technology entrepreneurship and commercialization.

Rationale

The course is integrated around the work that product development managers do, and the context within which they act. In organizing the course, we rejected the traditional organization around functional areas such as human resources, research and development (R&D), marketing, finance, etc. for two reasons. First, engineers and computer scientists responsible for engineering processes in the real world make integrative management decisions across management functions. Rarely can product development decisions be broken down into the traditional functional areas. Second, delivering a course partitioned by traditional management functions frequently turns into a series of disjointed lectures with no evident interdependences. Both reasons are supported by management theory and evidence.

From our research and our experience in the industry, and from the research of others, the TIM faculty has concluded that (i) the product development project is the main mechanism for learning and profit generation in successful technology-based companies, and (ii) the manager of the product development project can make or break the project.

Learning objectives

Students in TIMG 5001 will benefit in the following ways:

- Knowing how to access and apply the scholarly and practitioner literature on technology innovation management, product and service development, technology entrepreneurship, and commercialization.
- Acquiring tools and concepts that can be applied to improve existing product development organizations or establish new ones in the current VUCA environment.
- Developing personal skills in ideation, critical thinking and making, assessing and communicating recommendations on improving development and commercialization organizations.
- Developing the skills required to make, assess and communicate recommendations in technical and early market environments where there is not an abundance of information
- Using lessons learned in other settings to solve problems related to product and service development and to technology entrepreneurship and commercialization.

Brand

The brand of the TIM program is a valuable asset. All students in TIMG 5001 are expected to work hard to protect and enhance the value of the TIM brand.

Synchronous and Asynchronous Learning

Class sessions will be conducted in a **HyFlex mode** as combinations of lectures, in-class group activities and

interactive discussions, workshops on the course assignments, student presentations, and feedback from the instructor and peers on student presentations. Class sessions are the *synchronous* portion of the coursework when all of us, from the Carleton campus or anywhere in the world, come together at the same time for learning. Most sessions are also recorded for later review.

The *asynchronous* portion of the coursework, completed outside of classes, is Carleton University's **Brightspace Learning Management System** (LMS): https://brightspace.carleton.ca/ You can learn about Brightspace here: https://carleton.ca/brightspace/students/

Brightspace is the repository for course material and recordings of class sessions, the means of submitting coursework and assignments, and the location of discussion forums and other collaboration tools. The instructor will post the documents for most class sessions before class.

Each week there will be assigned readings and tasks to be completed before class. Students should attend every class session, arrive prepared to discuss the assigned reading and tasks for that session and participate actively in discussions, activities, and workshops during the class session. Between class sessions, students should actively use the discussion forums and other tools for asynchronous collaboration. Success as a manager depends on verbal communication skills. This course allows students to develop their ability to make, assess and communicate recommendations to their peers.

During the student group presentation sessions, groups will make short presentations on their assignments. Each group decides who presents what and the order. Before 11:59 p.m. on the day before the presentation will be delivered, each group will distribute to all members of the class the slides to be presented the next day. No exceptions. Presentations will be followed by clarification questions and discussions that involve the entire class. An excellent group presentation is clear, concise, insightful and completed within the allotted time.

Student evaluation

Students are required to work in groups to complete two assignments, work individually to write a final examination, make presentations during class sessions, and actively participate in class discussions and other class activities. To determine the course grade, these components will be weighted as follows:

Assignment	Weight	Deadline
Four reflections - individual	20%	After weeks 4, 7, 10 and 14 on Sunday at 11:59 pm
Assignment 1: Idea pitch (group)	15%	February 9th 4:59 pm
Assignment 2: Hack the university presentation (group)	15%	April 6th 4:59 pm
Final Examination – Systematic literature review of a TIM topic of your choice (individual)	50%	April 23rd at 11:59 pm

Assignments submitted late and presentations not made will receive a grade of zero. All students in a group

receive the same grade. Final grade reports will follow Carleton University guidelines.

Individual reflections

You will complete four short reflections throughout the term. Submit each reflection on Brightspace by 11:59 pm on the due date. Use clear, professional writing and, where relevant, reference course readings or materials on Brightspace.

Reflection 1 — Video: "What I understand about literature reviews" (2 minutes) — 5%

Summarize in your own words what a systematic literature review is, why it matters in TIM, and what you personally find most challenging about it.

Submit a video of up to 2:00 (±15 seconds). Speak on camera or record slides with narration. Include a brief on-screen title.

Prompts to address (succinctly):

- Purpose and value of literature reviews in innovation management.
- One concrete challenge you face (e.g., search strategy, screening, synthesis) and how you plan to overcome it.
- One skill you will develop next (e.g., protocol design, PRISMA flow, coding).

Due: Sunday after Class 4 (11:59 pm).

Reflection 2 — 1-page write-up: "Building the client pitch" — 5%

Reflect on your experience developing the pitch assignment for our client (assignment 1). Submit a 1 page write up.

Prompts to address:

- What changed in your thinking during Weeks 4–6 (assumptions tested, feedback, risks).
- What you would do differently in your next iteration and why.

Due: Sunday after the pitch (11:59 pm).

Reflection 3 — Written model: "My framework for managing innovation" — 5%

After completing the asynchronous online modules and lectures on innovation, synthesize your learning into a concise model for managing innovation.

Your submission will include the following:

- A simple diagram (e.g., boxes/arrows) showing stages, decision gates, and feedback loops, and
- 400–600 words explaining your model's logic (key constructs, relationships, when/why it works, limits), with brief citations to course materials/modules.
- Submit as a single PDF that includes the figure and text. Hand-drawn sketches are acceptable if legible.

Due: Sunday after Class 10 (11:59 pm).

Reflection 4 — Idea burst: "Hack the University—with AI" — 5%

Generate additional, concrete ideas for how Carleton could be "hacked" (improved) and show how AI can enable each idea. Submit at least three new "Hack the University" ideas.

For each idea, provide:

- A 2–3 sentence description of the improvement/opportunity and who benefits.
- The AI tool(s) or approach you would use and how they help.
- The next actionable step (what you'd do within two weeks).

Due: Sunday after Class 14 (11:59 pm).

Grading rubric (5 points per reflection → scaled to 5%)

- Accuracy & Concept Use (1 pt) – Uses core course concepts correctly; avoids misconceptions.
- Insight & Reflection (1 pt) – Goes beyond description; shows personal learning and judgment.
- Evidence/Links (1 pt) – References a reading, module, or client input where relevant.
- Clarity & Structure (1 pt) – Organized, concise, within limits; video/audio intelligible where applicable.
- Professionalism (1 pt) – On time; correct file/link format; AI-use disclosure included.

Reflection title	Due date	% of grade
Reflection 1 — Video: What I understand about literature reviews	February 1st, 2026, 11:59 pm	5%
Reflection 2 — 1-page: Building the client pitch (law firm)	February 22nd, 2026, 11:59 pm	5%
Reflection 3 — Model: My framework for managing innovation	March 15th, 2026, 11:59 pm	5%
Reflection 4 — Idea burst: Hack the University—with AI	April 12th, 2026, 11:59 pm	5%

Assignment 1: Idea pitch (group)

In week 4 of the course, a client will join us in class to present a challenge they are facing. For the next few weeks, we will be working on brainstorming product or service solutions for them that you will develop up to the point of a Minimum Viable Product. You will pitch this solution in week 6 to the client in a 10-minute presentation. This assignment is intended to simulate the real-world environment, where ideation and developing ideas into business opportunities have become key for innovative companies.

The following template will be used to grade your presentation. We use the GPA system ranging from an A+ (4.3) to F (0.0). Grades in the A range indicate that your work exceeds expectations, those in the B range indicate that your work meets expectations, those in the C range indicate that the quality of your work is somewhat below expectations, those in the D range indicate that the quality of your work is much below expectations, and sections not completed will receive an F.

Area:	Weight
Content of presentation: We are asking whether you address the content of the ten slides detailed here. We are also looking for whether you do so in a way that prevents you from telling the common "entrepreneur lies" as detailed in Kawasaki's talk (*listen here*)	60%
Style of presentation: The direction of the presentation is laid out in the introduction; the structure is unified and coherent; the conclusion is precise and relevant. The presentation is creative, grabs the audience's attention and is appropriate for the product/service being pitched. If multiple team members are presenting, the flow is smooth and professional.	20%
Q&A: We are looking for the ability to answer and respond appropriately to questions (e.g. admit when you don't know; ability to take criticism without getting defensive) and to work as a team (e.g. don't contradict one another in your responses, share questions).	20%
Total	**100%**

Assignment 2: Hack the University (group)

In this assignment, you will explore how technology is reshaping university education—and how Carleton can lead that transformation. Your challenge is to identify a real opportunity or problem within the university that relates to the future of learning, teaching, or academic life. You'll work in teams to develop a full-scale solution that leverages technology to improve the student experience, enhance teaching practices, or reimagine how education is delivered. We will launch the challenge in Week 12. You'll have two weeks to define your problem, research the context, and develop your solution. In Week 13, you'll have the chance to ask questions and get feedback from university stakeholders. In Week 14, you'll present your solution in class in a 10-minute presentation.

This is a fast-paced, creative exercise. You'll need to make quick decisions, iterate rapidly, and collaborate effectively. Your goal is to apply the principles of technology innovation management to a real-world educational setting.

What kind of problems can you tackle?

Here are some examples to spark your thinking:

- How can AI support personalized learning at Carleton?
- What digital tools could improve student engagement in hybrid or online courses?

- How might we redesign academic advising using technology?
- What innovations could make research opportunities more accessible to graduate students?
- How can we use data to improve course planning or student success?
- What role could immersive technologies (AR/VR) play in experiential learning?
- How can we make Brightspace smarter, more intuitive, or more integrated?
- You are encouraged to draw from your own experience at Carleton so far. Talk to classmates, explore campus services, and think critically about what could be improved or reimagined.

Your presentation should demonstrate:

- A clear understanding of the problem and its relevance to the future of education.
- A well-researched and feasible solution that uses technology meaningfully.
- Creativity, professionalism, and clarity.
- A realistic execution plan with timelines, risks, and costs.

All team members are expected to contribute meaningfully. If your name does not appear on the first page of the submission, you will need to submit your own individual assignment.

The following template will be used to grade your presentation. We use the GPA system ranging from an A+ (4.3) to F (0.0). Grades in the A range indicate that your work exceeds expectations, those in the B range indicate that your work meets expectations, those in the C range indicate that the quality of your work is somewhat below expectations, those in the D range indicate that the quality of your work is much below expectations, and sections not completed will receive an F.

Area:	**Weight**
Structure and cohesion: The primary and secondary issues are clearly identified and defined. The critical issues are presented and supported with data from client's presentation and brief.	20%
Argument and resolution: The presentation shows a strong understanding of the industry, customer and organization. There is evidence of qualitative and/or quantitative analysis used and supported effectively. The implications and risks are identified and effectively discussed.	40%
Originality and professionalism: Recommendations follow a logical sequence and address all issues identified. Supporting evidence is used effectively, and the outcomes are feasible, realistic and tailored to the organization. Alternatives are identified and discussed, and the selection process is explained. Unique, persuasive and creative recommendations.	20%
Quality of execution proposal: Comprehensive timeline and actionable plans to execute recommendations are presented. Possible risks and mitigations are discussed effectively. Possible costs of the solution are identified and justified persuasively. The overall implementation strategy is clear.	20%

Total	**100%**

Assignment 3: Systematic literature review of a TIM topic of your choice

In this assignment, you will individually conduct a systematic literature review on a topic of your choice within the technology innovation management domain. You are encouraged to make use of the process outlined on Brightspace (Method and AI-tools used to prepare systematic literature reviews).

Begin by selecting a relevant topic and formulating a clear research question using an appropriate framework (such as PICO, SPIDER, or PCC), and develop a protocol that outlines your objectives, criteria for study inclusion, and planned search strategy.

You will then perform a comprehensive literature search across multiple databases and sources, screen and select studies using explicit inclusion and exclusion criteria (documenting the process with a flow diagram), and extract data systematically with standardized forms.

Your review should include a critical appraisal of the quality and risk of bias of the included studies, followed by a synthesis of the findings. Throughout the process, you are encouraged to leverage AI tools for tasks such as search query optimization, screening, or data analysis, and you should provide a brief discussion of how these tools enhance your review, including their benefits and limitations.

Your final report should adhere to PRISMA 2020 guidelines, be written in a professional academic style, and include sections on the introduction, methods, results, discussion, and conclusions.

Assessment criteria for evaluation include clarity of the research question and protocol, methodological rigor, depth of synthesis and analysis, critical interpretation of findings, and effective integration of AI tools, as well as overall presentation and formatting – see below rubric for further details. Your paper should be 3000–4000 words in length, double-spaced, and be submitted as a PDF by the deadline.

Area	Criteria	Weight
Research Question and Protocol	Clarity and relevance of the research question; appropriate use of frameworks (e.g., PICO); thorough protocol outlining objectives, criteria, and search strategy.	15%
Methodology and Process Description	Detailed explanation of each step of the systematic review process (literature search, screening, extraction, appraisal, synthesis, reporting); transparent and replicable methods.	25%
Data Synthesis and Analysis	Rigor and depth in synthesizing the literature; effective integration of quantitative and qualitative findings (including AI insights).	25%
Interpretation and Discussion	Critical evaluation of findings; discussion of limitations, implications, and how results compare with existing literature; clarity in recommendations for practice or future research.	15%
Use and Documentation of AI Tools	Clear explanation of AI tools used; discussion of their role in enhancing the review process; critical reflection on benefits and limitations; proper citation of all AI resources.	10%
Presentation and Formatting	Professional quality of writing, coherence, and clarity; effective use of visuals and overall structure.	10%

References and Citations	Appropriateness and currency of references; correct and complete citation of all sources including guidelines (PRISMA, Cochrane, etc.) and AI tools used.	10%

Group work and free loaders

There is zero tolerance for free loaders in the TIM program.

Group work is an important component of this course. You should work in the same group to prepare both assignments. The instructor can assign you to a group, or you can form your own groups. Group conflicts are to be dealt with by the group in a way that is fair, respectful and fast, without personal attacks. The instructor does not settle group disputes. The instructor may dissolve a group that is late submitting an assignment. A group of three is expected to deliver better work than a group of two.

Free loaders are not welcome anywhere. This course is no exception. The best way to deal with free loaders is to not include their names in the first page of the group assignments. If a student's name does not appear in an assignment submitted by his or her group, the student must submit his or her own assignment. If a student fails to submit an assignment with their name on the first page, the student will receive zero for the assignment.

Plagiarism

Plagiarism, including copying and handing in for credit someone else's work, is a serious instructional offence that will not be tolerated. Please refer to the section on instructional offenses in the Carleton Graduate Calendar for additional information. Plagiarism is against the TIM culture. A case of plagiarism will be referred to the Dean of the Faculty of Graduate and Postdoctoral Affairs (FGPA). The instructor will not deal with the matter directly. Carleton University has clear processes to deal with allegations of plagiarism.

Required reading

Please prepare the assigned reading for each class session before class. The assigned reading will be available through the public internet of Brightspace each relevant week.

Learning to access research literature to read journal articles and conference papers is an important component of the TIMG 5001 coursework. Reading for each week will be provided a week before the next class on the course Brightspace page.

Accessing journal articles through the Carleton Library

In early 2020, the Carleton Library launched *Omni*, a new library search tool, and retired the old library catalogue and search tools:
https://library.carleton.ca/library-news/omni-new-discovery-and-search-tool-library

The instructions below may change if Carleton modifies the *Omni* user interface. If so, revised information will be provided in class. To access the assigned journal articles electronically, go to the Carleton University Library website (https://library.carleton.ca) and click the "Journals" link directly below the search bar. This is the "Journal Search" page. Enter the title of the journal (not the title of the article) in the "Title or ISSN" field and click the magnifying glass icon. Select the record for the correct journal (likely the top item on the list of results). Select one of the databases on the list below the "Online availability" heading. Enter your

CarletonOne credentials (username and password) if prompted for authentication. From the journal table of contents, navigate to the volume number and issue number of the assigned article (first selecting the year of publication), then select the article from the list (by authors, title, and/or page numbers). Select "PDF Full Text" to open or download a PDF of the article.

Information on Academic Accommodations

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 is 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

TIMG 5001 Class Schedule (tentative; may be revised throughout the course)

#	Date	**Topic**	**Reading**
1	Jan 5	Introduction to TIM	Bennett, N., & Lemoine, G. J. (2014). What VUCA really means for you. In *Harvard Business Review* (Vol. 92, Number 1,2, pp. 27-). Harvard Business Review.
2	Jan 12	Principles of Innovation Management – some key research questions and literature search	Christensen, C. M. (2016). The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Review Press. – read chapters 1 and 11.
3	Jan 19	Benefits of AI in Technology Innovation Management – performing a literature review with AI	Gama, F., & Magistretti, S. (2023). Artificial intelligence in innovation management: A review of innovation capabilities and a taxonomy of AI applications. The Journal of Product Innovation Management. Eapen, T. T., Finkenstadt, D. J., Folk, J., & Venkataswamy, L. (2023). How Generative AI Can Augment Human Creativity. In *Harvard business review* (Vol. 101, Number 4, pp. 56–64). Harvard Business Review. Enholm, I.M., Papagiannidis, E., Mikalef, P. et al. Artificial Intelligence and Business Value: a Literature Review. Inf Syst Front 24, 1709–1734 (2022).
4	Jan 26	Ideation techniques and tools	How to Build Your Creative Confidence by David Kelley Lebeck, P., Lee, T., & O'Mahony, L. (2023). Prompts for Creativity. In Creativity and Innovation (pp. 85–115). Palgrave Macmillan. Serrat, O. (2017). The SCAMPER Technique. In Knowledge Solutions. Springer Singapore Pte. Limited.
5	Feb 2	Market research and analysis/ building your MVP	Fossitt, J. (2024). Introduction to Market Research. – read Part I Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. Journal of the Academy of Marketing Science, 49(1), 30–50.

			How to build an MVP by Michael Seibel Olsen, D., & Wallace, C. (2015). The lean product playbook: how to innovate with minimum viable products and rapid customer feedback (1st edition). Wiley.
6	Feb 9	Pitch presentations	
7	Feb 16	**Reading week – no class**	
8	Feb 23	Managing innovative projects	Cooper, R. G. (2024). The AI transformation of product innovation. Industrial Marketing Management, 119, 62–74.
9	Mar 2	AI for corporate innovation (guest speaker – Jeff Downie, Univerus)	
10	Mar 9	Governance and intellectual property	Gassmann, O., Bader, M. A., & Thompson, M. J. (2021). Fundamentals of Intellectual Property Rights. In *Patent Management* (pp. 1–25). Springer International Publishing.
11	Mar 16	Innovation in the age of data and AI – guest speaker	
12	Mar 23	Hack the university challenge - hackathon launch	Rys, M. (2023). Invention Development. The Hackathon Method. Knowledge Management Research & Practice, 21(3), 499–511. https://doi.org/10.1080/14778238.2021.1911607
13	Mar 30	Q&A and project work	
14	Apr 6	Hackathon presentations	