



Institute for Technology Entrepreneurship and Commercialization

TIMG 5001 Principles of Technology Innovation Management

Winter 2023 (January—April)

Time and place

Mondays, 6 p.m. – 9 p.m. (Eastern Time; UTC-5)

Nicol Building 3020 and online via BigBlueButton (HyFlex)

Website for course resources and online participation: <https://brightspace.carleton.ca>

Instructor

Professor Steven Muegge

5062 Nicol Building, 613-520-2600 x6804

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Office hours

The instructor is available by email at any time. Email is the preferred mode of communication.

The instructor will be available online for virtual office hours by appointment as needed, and regularly-scheduled office hours will be announced during the term (tentatively Wednesdays at 10 am).

Target audience

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

Students registered in all four TIM degree options – the Master of Applied Science (MASc), the Master of Engineering (MEng), the Master of Entrepreneurship (MEnt), and the Master of Applied Business Analytics (MABA) – 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 build on the literature in the fields of project management, leadership, industrial marketing, managerial economics and organizational behaviour.

Course Objectives

This course introduces students to the scholarly research literature and the applied practitioner literature in the field of technology innovation management.

We learn about topics that are critical for technology-based companies that compete in the global market for products and services. These topics include (i) product and service development and (ii) technology entrepreneurship and commercialization.

These topics cut across functional management areas and build on the scholarly research literature and applied practitioner literature in the fields of project management, industrial marketing, competitive strategy, organizational behaviour, leadership and managerial economics. Our perspective on these topics throughout the course is that of a product development manager.

Rationale

The course is integrated around the work that product development managers actually 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 who are responsible for engineering processes in the real world make management decisions that are integrative across management functions. Rarely can product development decisions be broken down into the traditional functional areas. Second, the delivery of a course partitioned by traditional management functions frequently turns into a series of disjointed lectures with no evident interdependences. Both of these reasons are supported by management theory and evidence.

From our research and our experience in industry, and from the research of others, the TIM faculty has concluded that (i) the product development project is a 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 a set of tools and concepts that can be applied to improve existing product development organizations or establish new ones
- Developing personal skills in making, assessing and communicating recommendations on how to improve 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
- Learning how to prepare a literature review and a research proposal for a TIM thesis
- Developing a practitioner article that proposes a solution to a management problem
- Developing a TIM research proposal document that is structured, formatted, and referenced in an academic style

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.

All presentations are made using TIM templates, all documents will follow TIM style guides, and all emails to and from students must use Carleton email accounts. Templates for assignment presentations are posted to the Brightspace LMS. Style guides for assignment documents are included in this syllabus.

Business ecosystem

Students will benefit from the unique experiential learning enabled by a *business ecosystem* anchored around the TIM program, developed since 2007.

TIM students can benefit from engaging with the organizations and communities anchored around the TIM ecosystem assets in table on the following page.

Nine ecosystem activities support making the National Capital Region the most entrepreneurial region in Canada (TIM program, TIM Lecture Series, LTW, NEI, CLA, IH, CU@Kanata, SERS, and lead projects). All of these ecosystem activities benefit TIM students and alumni located anywhere in the world.

	Asset	Description	Website	Contact
1	TIM program (keystone of our entrepreneurial ecosystem)	Master's program offering MASc, MEng, MEnt, and MABA degrees to experienced engineers, scientists, and business professionals	https://carleton.ca/tim	TIM Administrator timprogram@carleton.ca Steven Muegge (TIM Academic Director) smuegge@sce.carleton.ca
2	TIM Review	Peer-reviewed scholarly journal on technology entrepreneurship and commercialization	https://timreview.ca	Mika Westerlund (Editor-in-chief) Mika.Westerlund@carleton.ca
3	TIM Lecture Series	Public lectures on topics that support massive innovation and growth in employment in the region	https://carleton.ca/tim	TIM Administrator timprogram@carleton.ca
4	TIM Gate Process	Research process that supports TIM students to develop high quality TIM theses and projects	https://carleton.ca/tim	Steven Muegge smuegge@sce.carleton.ca
5	Lead To Win (LTW)	Accelerator to build ventures that generate \$1M annual revenue in three years. Ranked top-ten in North America (2015; UBI).	http://leadtowin.ca	Lead To Win Manager community@leadtowin.ca
6	Nicol Entrepreneurial Institute (NEI)	Provides paid internships for Carleton students who wish to work on launching their own companies		Tony Bailetti Tony.Bailetti@carleton.ca
7	Carleton Led Accelerator (CLA)	Space and services for entrepreneurs on the first floor of the St. Patrick's Building (SP102)		TIM Administrator timprogram@carleton.ca
8	BigBlueButton Foundation	Open source software foundation of the BigBlueButton web conferencing system	https://bigbluebutton.org	Steven Muegge (Executive Director) smuegge@bigbluebutton.org
9	Open Source Cyber Fusion Center	Industry-academic partnership to make small companies more resilient to cyber threats	https://newsroom.carleton.ca/2019/michael-weiss-receives-funding-to-create-an-open-source-cyber-fusion-centre/	Michael Weiss (Principal Investigator) weiss@sce.carleton.ca
10	Innovation Hub (IH)	Carleton innovation space for social impact, entrepreneurial experience, and next-generation global leaders	https://carleton.ca/innovationhub	John Nelson (Acting Director) john.nelson@carleton.ca
11	CU@Kanata (in Kanata North's Hub360)	Carleton's innovation space in Kanata, where industry, finance and academic partners collaborate and connect	https://carleton.ca/kanata/	
12	SERS	Global community advancing and disseminating high-quality educational resources to globally scale companies early, rapidly, and securely	https://globalgers.org	Tony Bailetti (Principal Investigator) Tony.Bailetti@carleton.ca
13	Lead projects (various)	Provide jobs, research assistantships, and learning opportunities for students		

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/>

You can sign in to Brightspace using your *MyCarletonOne* credentials – the same username, password, and two-factor authentication used to access your Carleton email account and Carleton Central. There are many ways to view and filter the Brightspace course list to locate our course; one easy way is click the “Winter 2023” filter to display only your courses for this term. Then from the course list click “TIMG 5001: Principles of Technology Innovation Management (Winter 2023)”. Brightspace courses for the Fall term become active on the morning of the first day of the Fall term; until the courses open, they appear as “inactive” and cannot be opened yet by 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, wikis, and other collaboration tools. The instructor will post the documents for most class sessions prior to class.

Our online classes use the BigBlueButton webconferencing system. You can learn about BigBlueButton here: <https://www.youtube.com/watch?v=Aw3Ajuy3kyk>
<https://bigbluebutton.org/teachers/tutorials/>
<https://carleton.ca/brightspace/students/participating-in-bigbluebutton/>
<https://newsroom.carleton.ca/story/pandemic-bigbluebutton-downloads/>

To participate in a synchronous class session online, first sign in to Brightspace using your MyCarletonOne credentials and navigate to our TIMG 5001 course (Winter 2023). Second, join our online classroom from within the Brightspace course. From the “Visible Table of Contents” in the left pane, click “Course Essentials” (the first module). From the Course Essentials module, click “Online classroom: BigBlueButton” (approximately the third link from the top). From the “Online classroom: BigBlueButton” task, click “Join Session” and follow the instructions that appear on your screen.

To join the audio portion of the online class, there are three options available: (1) you can use your computer speakers or headphones only (“Listen Only” option), (2) you can use a high-quality audio headset with a microphone (“Microphone” option), or (3) you can call in on a telephone. Option 1 is listen-only; options 2 and 3 both permit you to interact with others by speaking. Please mute your line when you are not speaking. If your audio is disruptive to others, you will be muted or disconnected.

- If you join using the “Microphone” option, we strongly recommend wearing an audio headset; please do not attempt to use the built-in microphones of laptops and standard webcams
- To call in on a phone, dial 1-613-317-3321 (1-855-215-5935 toll free in North America) and enter the conference PIN 306 297 964. Press the '0' key on your phone to mute/unmute yourself

The first half of our course emphasizes reading, lectures, and group activities and discussion, and the second half emphasizes student presentations. Each week there will be assigned readings and tasks to be completed prior to 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 provides an opportunity for students to develop their ability to make, assess and communicate recommendations to their peers.

During the student group presentation sessions, groups will make short online presentations on their assignments. Each group decides who presents what and the order. Before 6 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. Online presentations are significantly enhanced by sharing video of the presenters. Presentations will be followed by clarification questions and discussions that involve

the entire class. After all presentations are completed, lessons learned will be generated. The purpose of the lessons learned is to improve by a factor of 2X the content and style of the next presentations.

An excellent group presentation is clear, concise, and 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 1: Literature review (group)	
• Literature review presentation	10%
• Practitioner article	20%
• Assignment 2: Gate 0 research proposal (group)	
• Gate 0 research proposal presentation	10%
• Gate 0 research proposal document	20%
• Final Examination (individual)	30%
• Participation and contribution to the classroom and online learning environment (individual)	10%
	<hr/>
	100%

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.

Assignment 1: Literature review

Each student is required to work in a group (maximum of 3 students) to

- Identify a topic or research question
- Review the academic and practitioner literature relevant to the topic or research question
- Identify at least three groups (e.g., entrepreneurs, top management teams, and government policy-makers) who will be interested in reading your literature review and explain why
- Identify three, four, or five most-valued insights gained from producing the literature review

Each group will deliver the results of this work in formats:

- A *literature review presentation* of your results
- A *practitioner article* that applies what you learned from the management literature to propose a solution to a management problem

To understand what a good literature review looks like, please read the literature review articles assigned for session 2: Brown & Eisenhardt (1995), Krishnan & Ulrich (2001), and Shane & Ulrich (2004).

The list of better journals includes

- High-profile academic journals with broad scope: *Management Science*, *Organization Science*, *Academy of Management Journal (AMJ)*, *Academy of Management Review (AMR)*, *Administrative Science Quarterly (ASQ)*, and *Strategic Management Journal (SMJ)*.
- Specialized academic niche journals on technology management and entrepreneurship
 - *Research Policy*, *R&D Management*, *Journal of Product Innovation Management (JPIM)*
 - *Entrepreneurship: Theory and Practice*, *Strategic Entrepreneurship Journal (SEJ)*, *Entrepreneurship and Regional Development*, *Small Business Economics*
- High-profile managerial journals with a broad scope: *Harvard Business Review (HBR)*, *California Management Review (CMR)*, and *MIT Sloan Management Review (SMR)*. The primary audience for managerial journals is practitioners rather than researchers.
- Specialized managerial journals on TIM topics: *Technology Innovation Management Review (TIM Review)*; <https://timreview.ca>)

Millions of journal articles can be accessed online through the Carleton Library:

<https://library.carleton.ca>

To access journal articles remotely via the Internet, you will need your *MyCarletonOne* username and password. Help with off-campus access is available from the Carleton Library website here:

<https://library.carleton.ca/help/campus-login-help>

Use the *Academy of Management* (AoM) style for all references and in-text citations in your course assignments. This is the citation and referencing format used by the *Academy of Management Review* journal (AMR) and the *Technology Innovation Management Review* journal (TIM Review), and by most TIM theses and projects. The AoM style guide is available as a website or a PDF (in-text citations and references are on pp. 3-4):

<https://aom.org/research/publishing-with-aom/author-resources/editorial-style-guides>

https://aom.org/docs/default-source/publishing-with-aom/aom_journal_style_guidea3b84b773e3649569a17a05e14cc6eaf.pdf

Literature review presentation (first component of assignment 1)

Each group will present version 1 of the literature review presentation (slides with TIM format) in session 7, and present the final version of the literature review presentation (slides with TIM format) in session 12. Only the final version will be graded. The final version will be graded on four equally-weighted criteria: (1) slide content, (2) slide format, (3) delivery, and (4) answers to questions.

Slide decks to be presented must be posted to the TIM Learning Content Management System before 6 p.m. on the day before the presentation will be delivered in class. All students can access this material.

There will also be four interim deliverables to help students progress towards completion of the assignment: (1) group membership (submit the names of people that will be working together on the group assignment) one day before session 3, (2) topics for assignment 1 one day before session 4, (3) a draft list of reference one day before session 5, and (4) an updated list of references and a work plan one day before session 6.

The TIM literature review presentation template is posted to the Brightspace LMS.

Practitioner article based on literature review (second component of assignment 1)

Each group will submit a practitioner article that applies lessons learned from the management literature to propose a solution to a management problem. We will work together on developing these articles throughout the term, with in-class workshops in session 8 (title, abstract, and references) and session 10 (title, abstract, introduction, conclusion, and references). The final version will be delivered no later than session 13. Only the final version will be graded.

The source material for the article should be the same as the content of the presentation, however the structure, the style of writing, the format of the document, and the level of detail are different.

For examples of good practitioner articles, please read the articles assigned for session 6, especially Muegge (2013), and also Anderson et al. (2006), Blank (2013), Edelman (2015), and Johnson et al. (2008). You should also examine some past *TIM Review* articles that propose solutions to management problems, for example, the articles in the October 2012 issue on Born Global (<https://timreview.ca/issue/2012/october>) and the Bailetti (2012) review of the technology entrepreneurship literature (<https://timreview.ca/article/520>).

Articles should not exceed 5,000 words or be less than 2,000 words, and should follow the guidelines for authors submitting to the *Technology Innovation Management Review* journal (<https://timreview.ca/authorguidelines>) and use the manuscript template provided for authors. Further guidance on style and format will be provided in class.

Your article should include (but not be limited to) four required sections: abstract, introduction, conclusions, and references. Your article should also include one or more additional sections between the introduction and conclusions that develop the main arguments needed for the contribution.

The *title* (8 words maximum) should highlight the contribution of the article.

The *abstract* (200 words maximum) should provide clear and compelling answers to five questions:

1. What problem do you address?
2. Who cares the problem is solved?
3. What approach did you use to propose a solution?
4. What is the solution?
5. What are the expected consequences of implementing your solution?

The *introduction* (700 words maximum) should include the following seven parts:

1. Reason to read: Begin with one or two sentences to convince the reader to keep reading.
2. Introduce the topic: Provide a brief description of the problem you are trying to solve and an explanation why solving the problem is important.
3. Summarize previous research: Provide a well-rounded summary of previous research that is relevant to your topic.
4. Gaps: Describe where the previous research is lacking or potentially flawed. What is missing from previous studies on your topic? What research questions have yet to be answered?
5. Main argument: Summarize your three (or four, or five) main points of the article. Do not explain each point, but rather provide a concise and compelling summary for each point.
6. Contribution: Describe the contribution(s) your article makes.
7. Organization: Describe how your article is organized.

Additional sections after the introduction should develop the main arguments of the article. The section headings, organization, and content of these additional sections will be unique to your article. Please include an explanation of how you selected the sources included in the literature review.

The *conclusion* (300 words maximum) should include four parts:

1. Answer to “so what?”: Tell the reader why your article is important, meaningful and useful.
2. Synthesis: combine the various elements of your article into a whole. Don't summarize or repeat things that are in your paper, but rather show readers how the different parts of the paper fit together.
3. Suggestions for future work: Suggest future research topics that build on your article.
4. Call to action: Challenge readers to apply what they have learned to their own situations and lives.

References should be sequenced alphabetically, with a hanging indent, in the *Academy of Management* (AoM) style. Each reference should be complete and correct, with a corresponding in-text citation in the body of the article. Every citation requires a corresponding reference; every reference should be cited. When computing the word count for your article, do not count the words in the references section.

Assignment 2: Gate 0 research proposal

Each student is required to work in a group (maximum of 3 students) to prepare a research proposal for a TIM thesis following the TIM gate process. Each group will deliver their results in two formats:

- A *gate 0 research proposal presentation* where you present and defend your proposal
- A *gate 0 research proposal document* that is structured, formatted, and referenced in an academic style

More information about the TIM gate process will be provided in class. To understand what a completed TIM thesis looks like, please examine some of the TIM theses assigned as reading for session 4.

All completed TIM theses are available online through at least two online sources: (1) the Carleton University library website and (2) CURVE (the Carleton University Research Virtual Environment).

- To locate a TIM thesis in the library catalogue, search by author or title as you would for a book.
- To locate a TIM thesis in CURVE (<https://curve.carleton.ca>), Carleton’s open access repository, click “Theses and Dissertations”, then search by keyword, author, or title.

Use the *Academy of Management* (AoM) style for all in-text citations and references in your TIMG 5001 presentations and documents.

Research proposal presentation (first component of assignment 2)

A TIM Gate 0 thesis proposal presentation is comprised of twelve slides:

- *Title* of your proposed thesis, the author(s), and the date of the gate 0 presentation
- *Objective and deliverables* (i.e., a clear concise statement of what you will accomplish, and a list of the concrete tangible outcomes expected at the completion of your research)
- *Contribution* (i.e., the expect contributions of your research)
- *Method* (the activities to be undertaken to produce your deliverables; e.g., if testing hypotheses, specify the steps to be taken to acquire data on each variable and to conduct the statistical tests of each hypothesis; if using a grounded approach, specify the steps to be taken to acquire and analyze the data required on each case; if using a simulation approach, specify how your simulation will be built, tested and used to generate insight into the real situation simulated; if constructing a system, specify how your system will be calibrated, tested and used, and how those activities will produce new knowledge)
- *Relevance* (i.e., who cares about your research topic and why; use evidence with sources to demonstrate that academics and managers care about the topic of your research)
- *Literature review and lessons learned from the literature* (i.e., demonstrate that the literature supports your contribution; identify the salient sources; organize the literature into streams; for each stream provide key findings and references; identify the lessons learned) [two slides]
- *Theoretical framework* (e.g., if testing hypotheses, develop a diagram that presents and integrates your hypotheses; if using a grounded approach, specify the theoretical perspectives and methodology sources that will guide your research; if using a simulation approach, specify the salient features of the simulation approach to be taken that make it suitable for your purposes; if constructing a system, specify the engineering theory and design principles that will be used)
- *Research design, data acquisition, and data analysis* (specify what data are needed, how you obtain these data, and will you do with the data; e.g., if you are testing theory, specify the data that you will use to operationalize your theoretical variables; if you are developing new theory, specify the data you will use to develop new theoretical categories and propositions; if you are simulating or constructing a system, specify the data you will use to develop, calibrate and test your simulation model or working system) [three slides]
- *References* (use the *Academy of Management* style consistently and correctly; make each reference complete; limit your reference list to your critical sources)

Each group will present version 1 of the research proposal presentation (slides with TIM format) in [session 9](#), and present the final version of the research proposal presentation (slides with TIM format) in [session 13](#). Only the final version will be graded (same four criteria as the assignment 1 presentation).

Slide decks to be presented must be posted to the TIM Learning Content Management System before 6 p.m. on the day before the presentation will delivered in class. All students can access this material.

Research proposal document (second component of assignment 2)

Also in [session 13](#), each group will submit a gate 0 research proposal document. Content is similar to the content of the presentation, however the style and the format are different.

A TIM gate 0 research proposal document is typically comprised of an abstract and four chapters, and chapters may be further organized into sections and subsections:

- An *abstract* of no more than 150 words.
- *Chapter 1: Introduction*, providing background material and sections for *objective* (1.1), *deliverables* (1.2), *relevance* (1.3), *contribution* (1.4), and *organization* of the document (1.5).
- *Chapter 2: Literature review*, with a table organizing the literature into streams, a section for each stream, and a concluding subsection that provides summary and synthesis of salient findings and the implications for the objective and deliverables of the proposal.
- *Chapter 3: Research design and method*, with an explanation for each of the major research design decisions of your proposal, organized in appropriate subsections.
- *Chapter 4: References*, providing complete and correct *Academy of Management* style references for each source cited elsewhere in the document.

A TIM gate 0 research proposal document is similar in structure and style to the first three chapters of a completed TIM thesis or project report. Note that a completed TIM thesis or project report would follow the *Formatting Guidelines* maintained by the Carleton University Faculty of Graduate and Postdoctoral Affairs: <https://gradstudents.carleton.ca/thesis-requirements/formatting-guidelines/>

Your proposal should be written in a scholarly style like that of the academic articles assigned in class. Please employ hierarchical numbering of chapters, sections and subsections, number all pages, number and caption all figures (below) and tables (above), indent the first line of paragraphs, and follow other stylistic conventions to be discussed in class. We recommend serif fonts for body text (e.g., Times Roman), sans serif fonts for headings, tables, and figures (e.g., Arial), and left justification (not full or right justification). There is no minimum or maximum word or page count for the research proposal.

Final examination

The take-home final exam is an individual effort. The examination questions will be distributed in session 13 and your examination report with your answers is due at the end of the exam period, no later than 6 p.m. Eastern Time. The exam report must be delivered online or as specified by the instructor.

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.

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

Date	Session #	Topic	Assigned reading
Monday Jan. 9	Session 1	Orientation to the TIM Program Introduction to TIMG 5001 and administrative matters: TIMG 5001 course outline; TIM program; role of TIMG 5001 in TIM program; theory and evidence.	TIMG 5001 course syllabus Christensen & Raynor (2003)
Monday Jan. 16	Session 2	Literature reviews; introduction to product development In-class group activity.	Brown & Eisenhardt (1995) Krishnan & Ulrich (2001) Shane & Ulrich (2004)
Monday Jan. 23	Session 3	Product and service development 1. Discussion of assignment topics. Group membership for Assignment 1 is due.	MacCormack et al. (2001) Eisenhardt & Tabrizi (1995) Goldenberg et al. (2001) Haefliger et al. (2008)
Monday Jan. 30	Session 4	Product and service development 2. Topic for Assignment 1 is due. In-class group activity on assigned reading.	Bhuiyan et al. (2004) Ethiraj & Levinthal (2004) MacCormack et al. (2006) Prügl and Schreier (2006) <i>TIMG MASC thesis (choose one)</i>
Monday Feb. 6	Session 5	Product and service development 3. Draft list of reference is due (8 sources). In-class group activity on assigned reading.	Baldwin & Clark (2006) Baldwin & von Hippel (2011) Van de Ven (1986)
Monday Feb. 13	Session 6	Technology entrepreneurship and commercialization 1. Revised draft list of references is due (30 sources). In-class activity on insights from machine learning.	Anderson et al. (2006) Blank (2013); Edelman (2015) Johnson et al. (2008) Muegge (2013)
Monday Feb. 20	Family Day and Winter Break (February 20-24). No classes.		
Monday Feb. 27	Session 7	Presentation of version 1 of Assignment 1. Lessons learned from making presentations.	
Monday March 6	Session 8	Technology entrepreneurship and commercialization 2. Writing with sources. Workshop on Assignment 1 practitioner article (title; abstract; references).	Teece (1988) Teece et al. (1997) Pisano & Teece (2007) West (2007) <i>Harvard Guide to Sources</i>
Monday March 13	Session 9	Presentation of version 1 of Assignment 2.	
Monday March 20	Session 10	Technology entrepreneurship and commercialization 3.	Ferrier (2001) Gans, Hsu & Stern (2002) Gans & Stern (2003) Lampikoski et al. (2014)
Monday March 27	Session 11	Guest speaker to be announced. Workshop on Assignment 1 practitioner article (title, abstract, introduction, conclusion; references).	
Monday April 3	Session 12	Presentation of final version of Assignment 1.	
Monday April 10	Session 13	Presentation of final version of Assignment 2. Assignment 1 and 2 documents are due.	
April 15-27	Final exam	Questions are posted by April 15 (start of exams). Answers are due by 6 p.m. on April 27 (end of exams).	

Required reading

Please prepare the assigned reading for each class session prior to class. The assigned reading for session 1 is available on the public Internet. The assigned reading for other sessions is available online through the Carleton Library.

Learning to access the research literature to read journal articles and conference papers is an important component of the TIMG 5001 course work.

Session 1: Theory and evidence

Christensen, C. M., & Raynor, M. E. 2003. Why hard-nosed executives should care about management theory. *Harvard Business Review*, 81(9): 66-74.

Link to online version:

<https://hbr.org/2003/09/why-hard-nosed-executives-should-care-about-management-theory>

Session 2: Literature reviews; introduction to product development

Brown, S. L., & Eisenhardt, K. M. 1995. Product development: Past research, present findings and future directions, *Academy of Management Review*, 20(2): 343-378.

Krishnan, V., & Ulrich, K. T. 2001. Product development decisions: A review of the literature. *Management Science*. 47(1): 1-21.

Shane, S., & Ulrich, K. T. 2004. Technological innovation, product development and entrepreneurship in Management Science, *Management Science*, 50(2): 133-144.

Session 3: Product and service development, theory and models as practical aids 1

MacCormack, A., Verganti, R. & Iansiti, M. 2001. Developing products on “Internet time”: The anatomy of a flexible development process. *Management Science*, 47(1): 133-150.

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Goldenberg, J., Lehmann, D. R., & Mazursky, D. 2001. The idea itself and the circumstances of its emergence as predictors of new product success. *Management Science*, 47(1): 69-85.

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Session 4: Product and service development, theory and models as practical aids 2

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MacCormack, A., Rusnak, J., & Baldwin, C. 2006. Exploring the structure of complex software designs: An empirical study of open source and proprietary code. *Management Science*, 52(7): 1015–1030.

Prügl, R., & Schreier, M. 2006. Learning from leading-edge customers at The Sims: Opening up the innovation process using toolkits. *R&D Management*, 36(3): 237-250.

Please also examine the abstract, the table of contents, and the introductory chapter of any one of the following six Master of Applied Science (M.A.Sc.) TIM theses:

- Adegboyega, K. 2015. *Representing botnet-enabled cyber-attacks and botnet-takedowns using club theory*. Master of Applied Science thesis, Technology Innovation Management, Carleton University, Ottawa, Canada. <https://doi.org/10.22215/etd/2015-10896>
- Low, A. 2013. *Platform strategies in the electronic design automation industry*. Master of Applied Science thesis, Technology Innovation Management, Carleton University, Ottawa, Canada. <https://doi.org/10.22215/etd/2013-09980>
- Mezen, M. 2014. *Business ecosystems and new venture business models: An exploratory study of participation in the Lead To Win job-creation engine*. Master of Applied Science thesis, Technology Innovation Management, Carleton University, Ottawa, Canada. <https://doi.org/10.22215/etd/2014-10280>
- Murshed, S. M. M. 2017. *An investigation of software vulnerabilities in open source software projects using data from publicly-available online sources*. Master of Applied Science thesis, Technology Innovation Management, Carleton University, Ottawa, Canada. <https://doi.org/10.22215/etd/2017-11954>
- Reid, J. E. A. 2018. *Emancipated entrepreneuring in the nascent commercial spaceflight industry: Authoring ecosystems by Branson, Diamandis, and Musk*. Master of Applied Science thesis, Technology Innovation Management, Carleton University, Ottawa, Canada. <https://doi.org/10.22215/etd/2018-12632>
- Shaw, J. A. 2020. *The design of local ecosystems within a global technology entrepreneurship challenge*. Master of Applied Science thesis, Technology Innovation Management, Carleton University, Ottawa, Canada. <https://doi.org/10.22215/etd/2020-14175>

Session 5: Product and service development, theory and models as practical aids 3

- Baldwin, C.Y., & Clark, K.B. 2006. The architecture of participation: Does code architecture mitigate free riding in the open source development mode? *Management Science*, 52(7): 1116-1127.
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- Van de Ven, A. H. 1986. Central problems in the management of innovation. *Management Science*, 32(5): 590-607.

Session 6: Technology Entrepreneurship and Commercialization 1

- Anderson, J. C., Narus, J. A. & van Rossum, W. 2006. Customer value propositions in business markets. *Harvard Business Review*, 84(3): 90-99.
- Blank, S. 2013. Why the lean start-up changes everything. *Harvard Business Review*, 91(5): 63-72.
- Edelman, B. 2015. How to launch your digital platform. *Harvard Business Review*, 93(4): 90-97.
- Johnson, M. W., Christensen, C. M., & Kagermann, H. 2008. Reinventing your business model. *Harvard Business Review*, 86(12): 51-59.
- Muegge, S. M. 2013. Platforms, communities, and business ecosystems: Lessons learned about technology entrepreneurship in an interconnected world. *Technology Innovation Management Review*, 3(2): 5-15. Available online: <http://timreview.ca/article/655>

Session 8: Technology Entrepreneurship and Commercialization 2

Teece, D. J. 1988. Capturing value from technological innovation: integration, strategic partnering, and licensing decisions. *Interfaces*, 18(3): 46-61.

Teece, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7): 509-533.

Pisano, G. & Teece, D.J. 2007. How to capture value from innovation: shaping intellectual property and industry architecture. *California Management Review*, 50(1): 278-296.

West, J. 2007. Value capture and value networks in open source vendor strategies. *Hawaii International Conference on System Sciences*: 176-185.

The President and Fellows of Harvard College. 2021. *Harvard Guide to Using Sources*. Boston, MA: Office of Undergraduate Education, Harvard College. Available online:

<https://usingsources.fas.harvard.edu/>

- Two required chapters only: “Avoiding Plagiarism” and “Integrating Sources”

Additional readings of recent newspaper articles will be announced in the TIM LCMS.

Session 10: Technology Entrepreneurship and Commercialization 3

Ferrier, W. J. 2001. Navigating the competitive landscape: the drivers and consequences of competitive aggressiveness. *Academy of Management Journal*, 44(4): 858-877.

Gans, J. S., Hsu, D. H., & Stern, S. 2002. When does start-up innovation spur the gale of creative destruction? *RAND Journal of Economics*, 33(4): 571-586.

Gans, J. S., & Stern, S. 2003. The product market and the market for “ideas”: commercialization strategies for technology entrepreneurs. *Research Policy*, 32(2): 333-350.

Lampikoski, T., Westerlund, M., Risto, R., and Kristian, M. 2014. Green innovation games: Value creation strategies for corporate sustainability. *California Management Review*, 57(1): 88-116.

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 in electronic form, 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 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