TIMG 5101
Integrated Product Development

[0.5 credit]

Summer 2025

Institute of Technology Entrepreneurship and Commercialization

TIME AND PLACE:

May 5 to June 17, 2025, Tuesdays & Thursdays, 6:05-8:55 pm Eastern time (Ottawa time)

In person: Nicol Building 4020

Online (synchronous portion): The Zoom link is available on the course site in Brightspace.

DELIVERY MODE:

HyFlex: students can attend in-person, online or a combination of in-person and online. All course participants must use CU credentials and CU email accounts for communications and login. Students should engage in class regardless of in-person or online attendance.

INSTRUCTOR:

Mika Westerlund, mika.westerlund@carleton.ca

Office: Nicol Building 5029

Office hours: Email is the preferred mode of communication because there is a record of content exchanged. The instructor will be available after class and by appointment depending on availability. Email the instructor to schedule an on-campus or virtual appointment.

COURSE MATERIALS:

Access to online course sessions, course materials, list of readings and recorded videos will be provided through the CU Brightspace system: https://carleton.ca/brightspace/.

To access Brightspace and course materials you should use your CU credentials and select the TIMG 5101A Integrated Product Development.

Readings (articles) can be accessed and downloaded through the CU Library Online service using student's CU access privilege. A required textbook is not assigned for this course. Please note there can be changes to the material during the course. An up-to-date list of course readings will be available through the course site within Brightspace.

Lecture slides will be available within the course site on the day of each lecture.

COURSE DESCRIPTION:

Shift from integrated product development to open and user innovation. Discussion of key readings on the principles of open and user innovation, open source, crowdsourcing, gamification (innovation contests and tournaments), open labs (living labs and makerspaces), and community innovation (local open innovation and online communities). Topics are studied from the perspectives of value creation and value capture. Students will learn to assess the suitability of open and user innovation to seek solutions to complex R&D and business problems and create frameworks to communicate their ideas.

Please note that the description may differ from the calendar description.

OBJECTIVES AND LEARNING OUTCOMES:

The objective is to study value creation and value capture in different forms of open & user innovation through scholarly literature and case examples.

Upon course completion, participants will be able to choose, apply and present the use of open & user innovation methods to solve complex innovation problems.

CLASS SESSIONS:

Class sessions will include a combination of online lectures and interactive discussions. For each class, read the assigned articles and be prepared to:

- Present or discuss key points in the assigned course material.
- Apply learnings to real problems in organizations and society.
- Generate actionable insights and capture lessons learned.

Video recordings of class sessions will be available on the day after lecture within Brightspace.

ADMINISTRATIVE DETAILS:

Missing classes

If a student misses a class, it is the student's responsibility to find out what was covered, what assignments were made and what handouts were distributed. It is strongly recommended to watch the video recording of each missed class.

Plagiarism

Plagiarism is a serious instructional offense that will not be tolerated. A case of plagiarism in assignments or the take-home final exam will be referred to the Chair of the Department and the Carleton University Ethics Committee. The instructor will not deal with the matter directly. See: http://carleton.ca/registrar/academic-integrity/

Course grading

Marks will be assigned as follows:

Course requirement	**Mark (max.)**
4 x "One pager" assignment (individual effort), grading: accepted/not accepted	40
1 x Take-home final exam (individual effort), max. 30 pts for each question	60
Total (max.)	100

Each completed assignment (a total of 4 assignments), submitted through Brightspace by the deadline equals to 10 points, thereby totaling max. 40 points of the course requirements per student. All assignments are mandatory to pass the course. See below for details on the assignments and their deadlines.

The take-home final exam will be graded on a competitive basis. The best solution(s) to each of the two questions will receive 30 points. All other solutions will be graded, firstly, in comparison with the top solution(s) and, secondly, in comparison with other students' solutions to find the correct "grade basket". Assessment will emphasize originality, novelty, relevance, and depth of the solution, as well as quality and compliance with the provided guidelines. The maximum points any one student can receive is 60 points, a maximum of 30 points for each question. See below for details.

In accordance with the Carleton University Graduate Grading System, the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100 | A = 85-89 | A- = 80-84 | B+ = 77-79 | B = 73-76 | B- = 70-72 | F = Fail

The minimum passing grade for the course is B-.

Grades entered by Registrar: WDN = Withdrawn from the course | DEF = Deferred

ASSIGNMENTS:

The student must successfully complete 4 mandatory "One pager" assignments. Each assignment is valued at 10 points (4 x 10 pts = 40 points). The instructor will mark all assignments and exams himself. Late assignments are not acceptable without permission from the instructor. Assignments are individual efforts only and group effort is considered an act of plagiarism. Assignments should be submitted in PDF format through the course site within Brightspace by the deadline.

"One pagers" are 1-page long documents that state a problem solved and introduce a framework to illustrate the student's solution to the problem. "One pager" should be based on the student's own ideas and learnings from the course (readings, lessons). "One pager" assignment problems will be posted on Brightspace 4-5 days before the deadline. Selected "One pagers" may be invited for presentation and discussion in class.

Your "One pager" should show a) a descriptive title, b) a framework (illustration), and c) a brief synopsis (max. 100 words) that explains the framework. Please consult slides for further details.

Deadlines for the assignments:

Assignment	**Deadline**
#1: "Open source" (lectures 4 & 5)	Sun May 25
#2: "Crowdsourcing" (lectures 6 & 7)	Sun June 1
#3: "Gamification" (lectures 8 & 9)	Sun June 8
#4: "Open labs" (lectures 10 & 11)	Sun June 15

TAKE-HOME FINAL EXAM:

Take-home final exam is an individual effort, and group effort is considered an act of plagiarism. The examination questions along with detailed instructions and guidelines will be discussed in class and distributed through the course site within Brightspace during Session 13 on June 17.

Your examination report with the solutions is **due on Thursday June 26, 2025,** and it must be submitted in PDF format through the course site within Brightspace by the deadline. Late submission is not acceptable without permission from the instructor.

There are two questions in the final take-home exam. Both questions measure your ability to apply learnings from the course to solve a real-life problem. The maximum length of the take-home final exam report is 5 pages for the total of two essays plus a total of 2 pages for the frameworks plus 1 page for references, using 1.5 line spacing. Font type: Times New Roman or Arial. Font size measured in points (pts) must be 10 pts or higher. Use margins of one inch (minimum) all around. Cite course readings and material in the solutions and provide the list of references. The use of

additional, non-course material is encouraged, but it must be cited, and references must be provided. The take-home final exam will be marked based on a comparison with other students' reports.

CHATGPT:

Students are encouraged to use ChatGPT (https://chat.openai.com/chat) or another AI tool to:

- Improve the flow and content of your assignments and essays.
- Align parts of an assignment to make a whole.
- Acquire and synthetize information.
- Create notes and learning diaries of the course content.
- Eliminate errors in grammar, spelling, and capitalization as well as citations and references.
- Provide a skeletal structure for assignments.
- Generate ideas, make recommendations, and extract what is most important.

Students are discouraged to use ChatGPT to:

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

CLASS SCHEDULE:

This calendar is tentative; it may be modified as the course proceeds. Please consult the course site within Brightspace for up-to-date information on the course schedule and readings.

Session	Date	Readings	Other
Welcome to 5101			
#01	Tue May 6	• N/A	• Course outline
Introduction to open & user innovation – Pt. 1			
#02	Thu May 8	• Chesbrough (2007) • Curley (2016)	• N/A
Introduction to open & user innovation – Pt. 2			
#03	Tue May 13	Read two of the following articles: • Chesbrough et al. (2018) • Dell'Era et al. (2020) • Frankenberger et al. (2014)	• N/A
Open source – Pt. 1			
#04	Thu May 15	Read two of the following articles: • Raasch et al. (2009) • Reinauer & Hansen (2021) • Ulhoi (2004) Voluntary to read but save for the exam: • Wang (2012)	• N/A
Open source – Pt. 2			
#05	Tue May 20	Read two of the following articles: • Perr et al (2010)	• Deadline for A#1: Sunday May 25

		• Rajala et al. (2012) • Stamati et al. (2011)	
Crowdsourcing – Pt. 1			
#06	Thu May 22	Read <u>two</u> of the following articles: • Blohm et al. (2018) • Doan et al. (2011) • Wilson et al. (2017)	• N/A
Crowdsourcing – Pt. 2			
#07	Tue May 27	Read <u>two</u> of the following articles: • Djelassi & Decoopman (2013) • Kohler (2015) • Täuscher (2017)	• Deadline for A#2: Sunday June 1
Gamification - Pt. 1: Innovation contests & tournaments			
#08	Thu May 29	Read <u>two</u> of the following articles: • Liao & Xu (2020) • Morgan & Wang (2010) • Terwiesch et al. (2013)	• N/A
Gamification - Pt. 2: Serious games & platforms			
#09	Tue June 3	Read <u>two</u> of the following articles: • Patricio et al. (2018) • Parjanen & Hyypiä (2019) • Allal-Chérif et al. (2022)	• Deadline for A#3: Sunday June 8
Open labs – Pt. 1: Living labs			
#10	Thu June 5	Read <u>two</u> of the following articles: • Compagnucci et al. (2021) • Dell'Era & Landoni (2014) • Schuurman et al. (2011)	• N/A
Open labs – Pt. 2: Makerspaces			
#11	Tue June 10	Read <u>two</u> of the following articles: • Bell et al. (2014) • Diez (2012) • Rehm et al. (2021)	• Deadline for A#4: Sunday June 15
Community innovation - Pt. 1: Local open innovation			
#12	Thu June 12	Read <u>two</u> of the following articles: • Deutsch (2013) • Leckel et al. (2020) • Smulders (2013)	• N/A
Community innovation - Pt. 2: Online communities			
#13	Tue June 17	Read the following article: • Seidel et al. (2017) Voluntary to read but save for the exam: • Flowers (2008) • Füller et al. (2007) • Kohler et al. (2009)	• Delivery of the take home final exam (deadline June 26)

COURSE SHARING WEBSITES:

Materials created for this course (including presentations, slides, case studies, assignments, and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

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:

Academic accommodations for students with disabilities

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or a Letter of Accommodation at the beginning of the term. You must also contact the PMC (carleton.ca/pmc/) no later than two weeks before the assignment or exam requiring accommodation. After requesting accommodation from PMC, meet with your instructor to ensure accommodation arrangements are made.

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

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

Other accommodation

For information on other academic accommodation please contact the departmental administrator timprogram@CUNET.Carleton.ca or visit: https://students.carleton.ca/course-outline/

READINGS:

The following is a preliminary list of course articles and may change as the course progresses. An up-to-date list of readings is available on the course site within Brightspace. To access the required journal articles in electronic format, click the DOI or PERMALINK hyperlinks for each article listed on the course site or go to CU Library's website (https://library.carleton.ca/). Log in using your CU credentials and use the library's search engine to access and download the article(s).

Readings for Session 1 – Welcome to TIMG 5101:

- N/A

Readings for Session 2 – Introduction to open & user innovation – Pt. 1:

- Chesbrough, H.W. 2007. Why companies should have open business models? MIT Sloan Management Review, 48(2): 22-28.
- Curley, M. 2016. Twelve principles for open innovation 2.0. Nature, 533: 314-316.

Readings for Session 3 – Introduction to open & user innovation – Pt. 2:

Choose and read two of the following articles:

- Chesbrough, H., Lettl, C., & Ritter, T. 2018. Value Creation and Value Capture in Open Innovation. Journal of Product Innovation Management, 35(6): 930-938.
- Dell'Era, C., Di Minin, A., Ferrigno, G., Frattini, F., Landoni, P., & Verganti, R. 2020. Value capture in open innovation processes with radical circles: A qualitative analysis of firms' collaborations with Slow Food, Memphis, and Free Software Foundation. Technological Forecasting and Social Change, 158, 120128.
- Frankenberger, K., Weiblen, T. &; Gassmann, O. 2014. The antecedents of open business models: an exploratory study of incumbent firms. R&D Management, 44(2): 173-188.

Readings for Session 4 – Open source – Pt. 1:

Choose and read two of the following articles:

- Raasch, C., Herstatt, C., & Balka, K. 2009. On the open design of tangible goods. R&D Management, 39(4): 382-393.

- Reinauer, T., & Hansen, U.E. 2021. Determinants of adoption in open-source hardware: A review of small wind turbines. Technovation, 106, 102289.
- Ulhoi, J.P. 2004. Open source development: a hybrid in innovation and management theory. Management Decision, 42(9): 1095-1114.

Please download and save the following article for the final exam purposes. Reading this article is voluntary because the instructor will present it in class.

- Wang, J. 2012. Survival factors for Free Open Source Software projects: A multi-stage perspective. European Management Journal, 30: 352-371.

Readings for Session 5 – Open source – Pt. 2:

Choose and read two of the following articles:

- Perr, J., Appleyard, M.M. & Sullivan, P. 2010. Open for business: emerging business models in open source software. International Journal of Technology Management, 52(3/4): 432-456.
- Rajala, R., Westerlund, M. & Möller, K. 2012. Strategic flexibility in open innovation - designing business models for open source software. European Journal of Marketing, 46(10): 1368-1388.
- Stamati, T., Lakka, S., Michalakelis, C., & Martakos, D. 2011. The Ontology of the OSS Business Model: An Exploratory Study. International Journal of Open Source Software & Processes, 3(1): 39-59.

Readings for Session 6 – Crowdsourcing – Pt. 1:

Choose and read two of the following articles:

- Blohm, I., Zogaj, S., Bretschneider, U., & Leimeister, J.M. 2018. How to Manage Crowdsourcing Platforms Effectively? California Management Review, 60(2): 122-149.
- Doan, A., Ramakrishnan, R. & Halevy, A.Y. 2011. Crowdsourcing-systems on the world-wide web. Communications of the ACM, 54(4): 86–96.
- Wilson, M., Robson, K. & Botha, E. 2017. Crowdsourcing in a time of empowered stakeholders: Lessons from crowdsourcing campaigns. Business Horizons, 60(2): 247—253.

Readings for Session 7 – Crowdsourcing – Pt. 2:

Choose and read two of the following articles:

- Djelassi, S. & Decoopman, I. 2013. Customers' participation in product development through crowdsourcing: Issues and implications. Industrial Marketing Management, 42(5): 683–692.

- Kohler, T. 2015. Crowdsourcing-based business models: How to create and capture value. California Management Review, 57(4): 63-84.
- Täuscher, K. 2017. Leveraging collective intelligence: How to design and manage crowd-based business models. Business Horizons, 60(2): 237-245.

Readings for Session 8 – Gamification - Pt. 1: Innovation contests & tournaments:

Choose and read two of the following articles:

- Liao, T., & Xu, K. 2020. A process approach to understanding multiple open source innovation contests – Assessing the contest structures, execution, and participant responses in the android developer challenges. Information and Organization, 30(2), 100300.
- Morgan, J., & Wang, R. 2010. Tournaments for Ideas. California Management Review, 52(2): 77–97.
- Terwiesch, C., Mehta, S.J., & Volpp, K.G. 2013. Innovating in health delivery: The Penn medicine innovation tournament. Healthcare, 1(1–2): 37-41.

Readings for Session 9 – Gamification - Pt. 2: Serious games & platforms:

Choose and read two of the following articles:

- Patrício, R., Moreira, A.C., & Zurlo, F. (2018). Gamification approaches to the early stage of innovation. Creativity & Innovation Management, 27(4): 499-511.
- Parjanen, S., & Hyypiä, M. (2019). Innotin game supporting collective creativity in innovation activities. Journal of Business Research, 96: 26-34.
- Allal-Chérif, O., Lombardo, E., & Jaotombo, F. (2022). Serious games for managers: Creating cognitive, financial, technological, social, and emotional value in in-service training. Journal of Business Research, 146: 166-175.

Readings for Session 10 – Open labs – Pt. 1: Living labs:

Choose and read two of the following articles:

- Compagnucci, L., Spigarelli, F., Coelho, J., & Duarte, C. 2021. Living Labs and user engagement for innovation and sustainability. Journal of Cleaner Production, 289, 125721.
- Dell'Era, C., & Landoni, P. 2014. Living Lab: A Methodology between User-Centred Design and Participatory Design. Creativity and Innovation Management, 23(2): 137-154.
- Schuurman, D., De Moor, K., De Marez, L., & Evens, T. 2011. A Living Lab research approach for mobile TV. Telematics and Informatics, 28: 271–282.

Readings for Session 11 – Open labs – Pt. 2: Makerspaces:

Choose and read two of the following articles:

- Bell, F., Fletcher. G., Greenhill, A., Griffiths, M., & McLean, R. 2014. Making MadLab: A creative space for innovation and creating prototypes. Technological Forecasting & Social Change, 84: 43–53.
- Diez, T. 2012. Personal Fabrication: Fab Labs as Platforms for Citizen-Based Innovation, from Microcontrollers to Cities. Nexus Network Journal, 14: 457–468.
- Rehm, S.-V., McLoughlin, S., & Maccani, G. 2021. Experimentation Platforms as Bridges to Urban Sustainability. Smart Cities, 4(2): 569–588.

Readings for Session 12 – Community innovation - Pt. 1: Local open innovation:

Choose and read two of the following articles:

- Deutsch, C. 2013. The Seeking Solutions Approach: Solving Challenging Business Problems with Local Open Innovation. Technology Innovation Management Review, 3(3): 6-13.
- Leckel, A., Veilleux, S., & Dana, L.P. 2020. Local Open Innovation: A means for public policy to increase collaboration for innovation in SMEs. Technological Forecasting and Social Change,153,119891.
- Smulders, O. 2013. Local Open Innovation: How to Go from Ideas to Solutions. Technology Innovation Management Review, 3(3): 21-26.

Readings for Session 13 – Community innovation - Pt. 2: Online communities

Read the following article:

- Seidel, V.P., Langner, P., & Sims, J. 2017. Dominant communities and dominant designs: Community-based innovation in the context of the technology life cycle. Strategic Organization, 15(2): 220–241.

Please download and save the following articles for the final exam purposes. Reading these articles is voluntary because the instructor will present them in class.

- Flowers, S. 2008. Harnessing the hackers: The emergence and exploitation of outlaw innovation. Research Policy, 37: 177–193.
- Füller, J., Jawecki, G., & Mühlbacher, H. 2007. Innovation creation by online basketball communities. Journal of Business Research, 60: 60–71.
- Kohler, T., Matzler, K., & Füller, J. 2009. Avatar-based innovation: Using virtual worlds for real-world innovation. Technovation, 29: 395–407.