

Team Project: Technological Stewardship in Capstone Design

Project Introduction

The team project for ENGI 8152 (40% of your final mark) will focus on the broader implications of your Senior Design Project. The main deliverable for this project is a 12min pre-recorded team presentation (voiceover powerpoint, video, etc), supported by other deliverables that build into the presentation along the way. The presentation will be made available for your peers to view and comment on. This year's project theme is ***Technological Stewardship in Capstone Design***.

ENGI 8152 is partnering with the Engineering Change Lab (ECL) to participate in the Technological Stewardship Practice Program (TSPP). You will work your way through the TSPP to explore the concept of tech stewardship and have the opportunity to earn bonus course credit in ENGI 8152, and an external micro-credential from the Tech Stewardship Network.

[Technological stewardship](#) is a professional identity, an orientation, and a practice. It refers to “behavior that ensures technology is beneficial for all.” Tech stewardship is **purposeful, responsible, inclusive, and regenerative**. It includes the following behaviours:

- **Seek purpose:** direct tech development to maximize positive outcomes for all
- **Take responsibility:** anticipate, monitor and manage the complex impacts of technology
- **Expand inclusion:** expand who and what is considered and involved in decision-making
- **Work to regenerate:** enhance the health of the various systems with which we engage

Technological stewards commit to:

- **Advance Understanding:** We continuously deepen our understanding of our relationship with technology, challenge dangerously limited narratives and stereotypes.
- **Deliberate Values:** We seek to understand how our values are shaping and being shaped by the technologies we build and scale.
- **Practice Behaviours:** We support each other to practice the daily behaviours that enable progress in all its forms—failed attempts, pragmatic compromise, incremental steps and breakthroughs.

You will work in your Capstone Design Teams for the ENGI 8152 team project in order to examine the following question: **“What are the challenges and opportunities for your capstone design project to demonstrate the principles, commitments and behaviours of technological stewardship?”**

Note

Please do not use any form of generative AI (e.g. ChatGPT, GPT-4, Bard, etc) that falls outside the “acceptable use” policy for this course. If you are not sure, please run your question by us.

Deliverables and dates

Part 1: Team contract and project brainstorming

Week of January 20

The team contract is a document that you will use to ensure your team performs effectively. It outlines the expectations, behaviours, and goals that your team commits to uphold during the project. The contract will also include space and guidelines for the topic proposal for your team project.

- Draft your team contract using the template provided in the Brightspace shell.
- Ensure all members participate in drafting the contract.

Each team member is expected to do some thinking and brainstorming about the team project topic.

In order to get started:

- Complete the Tech Stewardship modules A1-A5 through the online TSPP platform by the time you do the January 23 in-class brainstorming exercise so that you get an idea of what “tech stewardship” is and why it matters.
- Attend class on January 23 for the in-class brainstorming exercise. We’ll provide more guidance in order to prepare you and your team for the subsequent topic selection meeting with us.
- If you are unable to attend class, guidelines will be posted for an equivalent exercise to do on your own time that week.

Part 2: Topic Selection Meeting:

January 27-31 by appointment (5% of final course grade)

Each capstone design team will meet with the instructors to discuss potential project topics and the terms of their team contract.

- Meetings will take place by appointment between Monday January 27-Friday January 31, and will be a maximum of 20 minutes.
- You and your team will be expected to have completed some brainstorming in advance of the meeting. (See Part 1 above.)
- During the meeting be prepared to:
 - Briefly explain the purpose or objective of your capstone design project.
 - Respond to questions about the brainstorming exercise
 - Respond to questions about your draft team contract

Part 3: Submit team contract and project proposal (10% of final course grade, team submission):

Due Sunday February 2, 11:59pm in the designated folder.

- Upload your finalized contract and project proposal to the designated folder by Sunday February 2 (11:59pm)
- Make sure that all team members have signed off on the submission.

Part 4: Research for presentation (ongoing from late January until mid-March)

- Work on the TSPP modules according to the suggested pacing below; the modules will provide much of the foundation for your team project. Although the TSPP is designed to be completed through 1hr/wk over 12 weeks, it can also be completed in as little as 6 weeks –we recommend that you take an accelerated route: completing the modules by the start of March will position you to produce a much more effective presentation than if you waited until the end of the term to finish all the modules.

TSPP Module	Work on it during...
Welcome & Program Overview Advance Understanding (A1)	Week of January 13
A2 & A3	Week of January 20
A4 & A5	Week of January 27
Deliberate Values (D1 & D2)	Week of February 3
D3, D4, & D5	Week of February 10
Practice Behaviours (P) Overview P1	Week of February 17
P2	Week of February 24
P3	Week of March 3
P4	Week of March 10
P5 & Completion	Week of March 17
Complete all TSPP requirements by March 31. Upload your TSPP microcredential by Sunday April 13 in order to earn bonus course credit.	

- The TSPP is designed for participants to draw on work term experiences or capstone projects. For our purposes, it's best if you work through each reflection (and optional TSPP drop-in calls) with your capstone project in mind.
- Putting together the presentation will require research effort beyond completing the TSPP. Refer to the presentation guidelines below for what to include, which might require you to do some library or online research, interviews, surveys, market research, etc.

Part 5: Feedback on presentation dry-runs (15% of final course grade)

Submit draft presentation by Sunday March 9, 11:59pm

Provide peer review feedback by Wednesday March 19, 11:59pm

- Upload a dry-run of your presentation video and/or draft slides by Sunday March 9, 11:59pm. This material will be reviewed by a subset of your classmates according to the instructions given.
- Ideally it's in your best interest to submit a completely finished product in order to maximize the benefit of the feedback exercise, but we will accept slide decks without the voiceover, or partial recordings.
- Be prepared to view and comment on the dry-run presentations of two other project groups during the **week of March 10-19**. More instructions will follow on how to complete this exercise.

Part 6: Team Project Presentation

Dry-run due Sunday March 9, 11:59pm

Final version due anytime between Sunday March 23-30, 11:59pm (25% of final mark):

Your team will prepare a pre-recorded project presentation (voiceover Powerpoint, video, or some other audio-visual format that is approved by the instructors). Teams of 3-4 people will have 12 minutes to discuss their project, and teams of 5 will have 15 minutes. All team members should be prepared to speak for equal amounts of time. Credit for the presentation will be awarded primarily on the basis of clarity, content, team cohesion, and creativity. Credit will also be earned by keeping to the recommended time limit.

Presentation guidelines

Your presentation should be aimed at an educated but non-specialist audience. A good starting point is to imagine you will be addressing the current class of Engineering One students.

The presentation should do the following:

- Provide an agenda/roadmap of your presentation.
- Include a brief technical overview of your capstone design project that summarizes the design problem and/or product objectives.
 - What are your team's intentions with the design?
 - What are the intended effects of what you have designed?
 - What values help your team to judge the effectiveness of your design?
- Introduce the concept of tech stewardship and identify 2-3 major tech “value tensions” or polarities that relate to your capstone. How do these specific value tensions or polarities affect the kinds of design decisions you’re considering or the broader context in which your design operates?
 - (optional consideration for +5 bonus points) What is a “wicked question” that describes the broader system in which your design is supposed to work: Consider social, economic, political, ethical and/or environmental dimensions. The wicked question typically is framed as “How can we have X and also have Y?” How does this “wicked question” relate to tech stewardship and the value tensions you have identified?
- Create and explain at least one “polarity map” that illustrates a specific value tension or tech stewardship behaviour that you are working through in your project. Make sure the polarity map is specific to your project (i.e. don’t just refer to the generic polarity maps that have already been provided).
 - What challenges arise as you try to navigate those polarities or tech stewardship behaviours in your design work (i.e. unintended effects, constraints set by the client, constraints of cost or access to resources, etc.)?
 - What opportunities are there to demonstrate TS behaviours in the context of your design work?
- What are some actions your team did take or should have taken in order to demonstrate a higher degree of tech stewardship in your capstone project?
 - E.g., Did you change your capstone design in any respect, in light of looking at it through TS lenses?
 - If you had your time back, should you have changed anything about your capstone design to better align with technological stewardship values?

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- Reflect as a team on insights you have had:
 - What does it mean now to be a tech steward in your engineering discipline?
 - How have you individually or collectively grown as tech stewards this term?
- Include in-text citations of all relevant research material on each of your slides (use IEEE or APA format; this includes visuals, graphs, charts, statistics, facts, quotes, etc.) and provide a list of references at the end.

Other points to keep in mind:

- You may choose to do a “deep dive” into direct impacts/implications of your design, or you can use your capstone as a jumping off point to discuss Technological Stewardship in your field or discipline in a more general sense.
- As you consider the TS behaviours and their inherent polarities, it might help to search out other real-life examples from the news or from your own work experience to include in your presentation to illustrate TS behaviours in action, or missing-in-action. If your capstone work reflects work that’s happening elsewhere, or if it has an analogue or precursor out in the world, feel free to include those examples in your presentation to illustrate your points.
- Credit will be awarded on the basis of how thoughtful and comprehensive the analysis is. We are not looking at how successfully your capstone project meets the TS principles but rather how deeply you have considered the principles. The point of your exploration is not to “get Technological Stewardship right”—if your project fails to meet the principles but you have clearly and insightfully explained why, then that effort can still earn full credit: discuss where the design work fails to meet TS behaviours or misses the mark, or where you’re still struggling. For example, which value tension or stretch question did you struggle the most with and why?

Final presentation grading:

- Consult the grading scheme for detailed criteria.
- Include the signed Project Submission Statement (found at the end of this document) with your final submission.
- We will accept final submissions anytime between March 23 and March 30. The earlier you submit, the sooner you will receive feedback and a grade.
- We will provide qualitative feedback on your final presentation and assign a letter grade to each criteria (i.e. A, B, C, etc.), but you will have an opportunity to suggest a final numeric grade based on your efforts and our feedback. If your suggestion is reasonable then that is the presentation grade you will earn. If we don’t hear back from your team by the specified deadline, we will assign the numeric grade.

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Deliverable	Value	Due date
Topic selection meeting	5%	Monday January 27-Friday January 31
Team Contract and Topic Proposal	10%	Sunday February 2 (11:59pm)
Dry-run submission	--	Sunday March 9 (11:59pm)
Peer feedback exercise	15% participation credit	Monday March 10-Wednesday March 19 (11:59pm)
Final Presentation	25% (with an opportunity to suggest your number grade)	Anytime between Sunday March 23-Sunday March 30 (11:59pm)

Team Project Rationale: This project helps you and your team demonstrate an ability to analyze the impact of engineering on society and the environment as described by Graduate Attribute #9, Canadian Engineering Accreditation Board: “Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.”

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Project Submission Statement

ENGI 8152 Team Project Submission Statement

(To be signed and submitted with your Team Project Presentation)

We, __[capstone team name]_____ confirm that the accompanying Team Project Presentation is work produced entirely by us and is not the repetition of content from another course or other professional context (unless the ENGI 8152 instructors have otherwise granted permission).

Although our project may represent a survey of work by other researchers and from other sources, the organization and wording of our final report is entirely original, and all research material has been properly referenced and cited.

We understand that, if this assignment is found to contain any amount of copied or reused material, or unauthorized use of generative AI, then submission of this assignment will be considered to be an academic offence and we will be assigned a mark of zero for the Team Project component of the course.

Please complete the form below by hand or with a digital signature, and upload to the designated folder with your ENGI 8152 Presentation.

Student name and number (printed)

Student signature

Student name and number (printed)

Student signature

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