The Philosophy of Engineering Practice (PEP) Workshop

Workshop facilitators
- Dr. Kush Bubbar, University of New Brunswick
- Dr. John Donald, University of Guelph
- Dr. Alon Eisenstein, University of British Columbia Okanagan
- Dr. Marnie Jamieson, University of Alberta

Workshop description

The Philosophy of Engineering Practice (PEP) workshop guides participants, through dialogue and reflection, an exploration of the purpose of engineering practice within society and how engineering practice is supported and developed within engineering education. At its core, the PEP talk facilitates discussions around how engineering practice informs engineering graduate attributes, and how this practice supports the development of such attributes within students. This workshop builds on concepts from Engineering Design Education, Engineering for Sustainability, Engineering Leadership and Engineering Ethics. There is no prerequisite for this workshop and all participants are welcome.

The workshop is grounded in philosophies of education such as experiential education and critical pedagogy, as well as system thinking and system theories. The workshop applies socio-enviro-technical lenses such as the ethics of engineering practice, engineering culture, the role of citizen engineering, and activist engineering.

Specific learning objectives

By the end of this workshop, participants will be able to::
1. describe and explain how they perceive and conceptualize the concepts of *Engineering Identity* and *Engineering Practice*
2. analyze the power dynamics that influence *Engineering Identity* and *Engineering Practice* and create a system map that articulates their understanding
3. evaluate cultural norms (assumptions, beliefs, values), the positioning and interaction of cultural aspects and dimensions that relate to *Engineering Identity* and *Engineering Practice* and their implications for various groups within society
4. generate actionable steps that apply the understanding gained from the workshop into meaningful social change to the practice of engineering education

Overview of participatory learning activities

The workshop is structured to facilitate experiential learning through dialogue and reflection on three main concepts:
1. What are engineering practice and culture? How do they relate to engineering identity? Engineering identity is developed through a process of understanding what an engineer does and adopting shared assumptions, beliefs, and values as an individual comes to see themselves as an engineer and part of the profession.

2. How does engineering practice impact engineering and engineering education culture? Engineering practice and culture are not monolithic, however, there are shared assumptions, beliefs, and values that inform how engineers interact with each other; within institutional structures such as corporations, universities, start ups; within society and how engineers are perceived.
3. How can we use our understanding of engineering practice and culture to inform our practice of educating future engineers?

Throughout the day, attendees will work both individually and in small groups, participating in reflective and reflexive discussions and mapping activities. The workshop is meant to be generative and thought-provoking. The facilitators will present concepts and engage participants in dialogue and reflection.

Workshop timeline
AM1 (8:30-10am) - **What is Engineering Practice? - Philosophy**
 1. Introduction and setting the stage - experiential education philosophy and critical pedagogy (30min)
 2. Conceptualizing *Engineering Practice* and *Engineering Identity* individually and collectively (60min)

AM2 (10:30-12pm) - **What is Engineering Practice? - Application**
 3. Introduction to System Thinking and System Mapping (30min)
 4. Uncovering power dynamics that influence our perception of *Engineering Practice* and *Engineering Identity* (60min)

PM1 (13-14:30pm) - **Culture of Engineering Practice**
 5. Introduction to social structures and dynamics - culture, leadership and followership, embedded culture, innovation and entrepreneurship (30min)
 6. Exploring the implications of the system on cultural norms, value systems, barriers and 'othering' (60min)

PM2 (15:00-16:00) .- **Shaping the Practice of Engineering Education**
 7. Identifying opportunities for influencing and shaping engineering education structures and practices. Feedback on the workshop and future opportunities. (60min)