



UNIVERSITY OF  
**WATERLOO**



WATERLOO  
**Climate Institute**

ACE PROJECT NATIONAL FORUM: “DESIGNING CLIMATE-READY EDUCATION FOR THE NEXT GENERATION OF PROFESSIONALS” hosted by the Waterloo Climate Institute, February 2-5, 2025

## **INTEGRATING CLIMATE ADAPTATION INTO ENGINEERING EDUCATION: KEY TAKEAWAYS**

*Held online on Thursday February 5<sup>th</sup> from 11:30 am to 1pm EST*

### **SESSION DESCRIPTION:**

The session Integrating Climate Adaptation in Engineering Education explored emerging trends, best practices, and key resources for embedding climate adaptation into engineering education in Canada, with a particular focus on civil, environmental, and systems engineering. Guest speakers Nathan Durham and Jeanette Southwood (Engineers Canada), Nadine Ibrahim (University of Waterloo), and Jean-François Boland (École de technologie supérieure) initiated a dynamic discussion on current university practices, gaps and opportunities for advancement, and invited participants to share examples of climate adaptation education from engineering programs across the country. 57 people participated in this session, and they represented a range of academic and practitioner positions, largely from the Engineering discipline.

### **KEY TAKEAWAYS FROM THIS SESSION:**

- **Change management** at universities (e.g. to requires both leadership (creating vision) and management (executing change); leadership doesn't require a specific position but is about the actions you take
- **Competency frameworks.** ÉTS developed a framework of 9 competencies for sustainability transformation based on Redmond and Weck's work, emphasizing that sustainability must be diffused across all 12 Engineers Canada learning outcomes, not just impact on society and environment
- Key competencies for future engineers include life cycle thinking throughout project stages, systems thinking beyond technical specialization, advocacy skills for sustainable policies, and change leadership
- **Interdisciplinary collaboration** is essential, progressing from monodisciplinary to multidisciplinary (fruits in bowl) to interdisciplinary (fruit salad) to transdisciplinary (smoothie where disciplines blend)
- Practical implementation strategies include starting small with modest institutional grants, building cross-functional coalitions, conducting faculty interviews and student surveys, and not waiting to be an expert before taking action

- Major challenges include tightly constrained undergraduate curricula, multiple roadblocks to integration, administrative hurdles for interdisciplinary work, mixed faculty readiness, and time pressure from climate crisis urgency
- Framing matters: using "climate crisis" instead of "climate change" prompts more urgent attitudes and action
- Becoming a licensed engineer should be the goal, as licensure provides public trust needed to implement sustainability principles
- Engineers are well-positioned and empowered to be champions for climate change adaptation, with responsibility to educate students who will address the world we've created

## RESOURCES:

- [Accelerating Climate Change Adaptation Education \(2025\)](#)
- [Climate Fresk](#)
- [Climate Risk Institute](#)
- [Engineers and Geoscientists BC — Climate & Sustainability](#)
- [Engineers Canada — National Engineering Guidelines](#)
- [Engineers Canada — Principles of Climate Change Adaptation for Engineers \(PDF\)](#)
- [Federal sustainable development strategy — consultation](#)
- [Full Spectrum Competency Profile Pilot Study \(Engineers Canada\)](#)
- [Futures of Engineering Accreditation — Path Forward Report \(PDF\)](#)
- [Municipal Climate Adaptation Certificate \(Waterloo Climate Institute\)](#)
- [Pathway to Engineering](#)
- [Polytechnique Montréal MOOC: "Sustainability in Practice"](#)
- [The Engineer of 2050: Thematic Analysis \(2022\)](#)
- [UNB — Engineering Leadership in Design Innovation \(Graduate Studies\)](#)
- [UNB — Master of Engineering Leadership in Design Innovation \(MELDI\)](#)
- [UWaterloo — Interdisciplinary Capstone \(i-Capstone\): Future Cities](#)
- [World Federation of Engineering Organizations \(WFEO\)](#)
- Royal Roads Resilience by Design Lab's [Climate Action Competency Framework \(v2\)](#) for professionals
- Waterloo Climate Institute: [Integrating climate change into engineering programs: ACE curriculum brief.](#)
- Waterloo Climate Institute: [The status of climate change education in Canadian accounting, architecture, planning and engineering programs \(2025\)](#)

**For more information, please contact the Waterloo Climate Institute:  
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