

# Infrastructure Resilience Professional Credentialling Program: *Overview & Courses*



## Overview

The Infrastructure Resilience Professional (IRP) Credentialling Program is designed to help practitioners strengthen the knowledge and core competencies required to advance climate-resilient approaches for infrastructure planning, design and management. Engineers Canada, the regulatory body responsible for licensing Canada’s 300,000 engineers, initiated the IRP Program in 2016. The Program transferred in 2020 to the Climate Risk Institute (CRI), a Canadian not-for-profit organization specialized in capacity building for climate resiliency. Having re-instituted the IRP Program over the 2021-22 period, CRI now oversees all related training. The IRP Stewardship Committee - a volunteer body of experts in engineering, infrastructure, climate resiliency, adult education, and credentialling - advises on the development and maintenance of the IRP Program. Its Adjudication Subcommittee reviews IRP applications and recommends applicants for the credential.

The IRP Program includes six (6) online courses. These courses and the IRP credential itself help address the rising need for engineering professionals with the required knowledge and competencies to better consider the impacts of severe weather and climate change in the planning, design, construction, and management of infrastructure assets and systems. More information about requirements for obtaining the credential can be found on our [website](#).

*Figure 1: Completion of all six courses (or their equivalents) is part of the requirements to obtain the IRP credential.*



Courses are delivered as five-week sessions through an online learning management system, in partnership with Professional and Continuing Studies at Royal Roads University. Courses include self-paced content (including readings, videos, discussion groups, assignments, quizzes) as well as live facilitated sessions with instructors. Courses are led by experts in climate, risk, asset management, engineering, policy and procurement, climate law, and adaptation.

# The Courses

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## Climate Change and Infrastructure Risk: The PIEVC Protocol

This online course provides participants with information about, and practice with the PIEVC Protocol, a practical tool and process that supports the systematic assessment of the risks of extreme weather and future climate in relation to public infrastructure. The Protocol is a structured procedure using standard risk assessment processes to assess and fully document the vulnerability of infrastructure to the impacts of current and future climate at a screening level, and related risks.

## Asset Management and Climate Resiliency

This course introduces the fundamentals of asset management so that learners can identify the benefits and challenges of infrastructure asset management and link this to their own practice, including land use planning, operations and maintenance, finance, and risk management. The course provides an understanding of how climate can impact assets and services, and the integration of risk mitigation and adaptation measures over the life cycle of an asset. In taking this course, participants will recognize the potential impacts of climate change on asset lifecycle performance, identify opportunities to improve climate resilience of infrastructure, understand role of natural assets and natural asset management in climate resilience.

## Climate Law

This course provides an overview of legal frameworks of particular consequence for infrastructure resiliency and climate change and addresses existing and emerging legal obligations relevant to infrastructure practitioners at the provincial, federal and international levels. It focuses in particular on the roles and responsibilities of professional engineers and how engineers can adapt their practices to incorporate climate change and reduce exposure to potential negligence lawsuits. It also explores corporate issues relating to climate change, including risk disclosure requirements, asset management and director and officer obligations, as infrastructure professionals have roles to play in managing these risks. The course provides guidance for engineers and infrastructure professionals to encourage and support continuous learning in a rapidly evolving field of law and practice.

## Management of Climate Risk for Infrastructure Professionals

This course addresses the societal importance of risk-based decision making, introduces a diverse set of risk management frameworks, and reviews main principles and definitions underlying risk and, more specifically, public risk management. The course reviews core analytical tools used in risk assessment; explores trade-offs in choices among risk assessment methods; and addresses common human errors in reasoning about probability and risk. Using a climate change and flooding case study example, the course works through all key stages of risk assessment and management. This course explores risk communication theory, principles and practice.

## Applied Climate Science for Infrastructure Practitioners

This course focuses on integrating climate change information into engineering and environmental design, particularly for infrastructure and buildings. Examples will be drawn from various aspects of the built environment and engineering infrastructure to illustrate the impacts in a changing climate, possible mitigation, and adaptation schemes as well as challenges, opportunities, and engineering design decision-making under climate change uncertainty. The course discusses differences in language and practices between climate science and engineering communities and provide strategies to bridge these worlds.

## Climate Smart Policy and Procurement

This course equips engineers and other infrastructure professionals with foundational awareness of procurement processes, as well as knowledge of critical climate policies and their implications for procurement. The course provides an increased understanding of relevant stages of procurement processes, and reviews various types and approaches to procurement, including public private partnerships. The course provides insight into how climate policies and resilience can be reflected in procurement processes, contributing to greater infrastructure resilience to changing climate conditions.