



[EES1133H Climate Change Science and Modelling](#)

The course is designed to introduce the fundamental concepts underlying our current understanding of the climate system. The science of climate includes basic radiation physics and dynamics, which are the basis of modern climate modelling. The changes in the radiation energy budget will be examined in terms of natural variability and anthropogenic activities, in particular, greenhouse gases and their sources and sinks. Underlying physical processes that shape our climate will be explored e.g. solar variability, orbital mechanics, atmospheric and oceanic circulation, and volcanic and atmospheric aerosols. In addition, the types of climate modelling experiments performed with modern climate models and scenarios will be reviewed by focusing on the evidence for past and present climate change. The latest projections of future climate on a variety of temporal and spatial scales will also be presented and evaluated. This course is aimed at connecting the essentials of climate science and modelling, and training students to interpret the results of modelling experiments.

[EES1134 Climate Change Policy](#)

All policy is climate change policy. The challenges and solutions for climate change span across society and the economy, which means that addressing the climate crisis requires transformative change to both eliminate greenhouse gas emissions and adapt to the impacts of climate change. Global greenhouse gas emissions need to reduce rapidly in the next ten years and reach net zero around mid-century in order to have a chance of avoiding dangerous climate change. At the same time, climate change is exacerbating existing societal vulnerabilities and is having deep impacts across natural and social systems. This course focuses on the governance of the transformation necessary to address this crisis and covers theories behind and practical approaches to the multilevel governance of climate change. The course covers a range of public policy areas related to climate change mitigation and adaptation, including energy supply, energy use and demand, carbon markets and economic tools, food and agriculture, and transportation. In this course, students will learn about dealing with complexity in climate policy-making and the range of actors involved in climate change policy spanning multiple levels of government as well as non-state actors. The primary focus is on policy-making in Canada, but the course also incorporates international policy and global North case studies.

[EES1136H Climate Change Adaptation](#)

This graduate course will focus on adaptation science and practice at local, provincial, national and international scales. Students will learn about how climate change adaptation is perceived, studied and performed by civil society groups and governments through various theoretical perspectives: resilience theory, neo-liberal theory and critical theory. Students will also learn about different governance approaches that support adaptation: multi-level, poly-centric, experimental and anticipatory governance arrangements. Using case studies ranging from local adaptation planning in Canada to the IPCC's contributions to knowledge synthesis, students will gain a better understanding of the social, economic, political and ethical dilemmas at the core of adaptation science and practice. Combined lecture- 1 72.N11A5015DT/F3 11



quantify microbes, and microbial activities, in environmental samples. Students are given the opportunity to perform microbial enumeration and characterization techniques in the lab to supplement the lectures.

[EES1106H Geological Evolution and Environmental History of North America](#)

This course reviews the geological and environmental evolution of the North American continent over the past 4 billion years by exploring the range of plate tectonic processes involved in continental growth and how those processes are expressed today as geologic hazards. The course will also review the origins of Canada's natural resources and review changes in terrestrial and marine environments including climate, and the associated ecosystem changes up to the present day. Students will become familiar with recent anthropogenic influences on the environment in regard to waste management, resource extraction and the impacts of urbanization on watersheds on a weekend field trip. This course will provide students with knowledge of naturally occurring long





EES3000H Applied Conservation Biology

Canada has a complex conservation landscape. Through lectures and interactive discussions with leading Canadian conservation practitioners, this course will examine how conservation theory is put into practice in Canada from our international obligations to federal and provincial legislation and policies, and the role of environmental non-government organizations. The course will emphasize how conservation theory is put into practice in Canada, from its international obligation (Convention on Biological Diversity) to its federal legislation (Species at Risk Act) and policies (Canadian Biodiversity Strategy) to provincial legislation and policies, and the role of environmental non-government organizations (ENGOS). The course will link conservation science theory to policy in Canada through lectures and interactive panel discussions with leading Canadian conservation practitioners. The course will provide the students with an in-depth understanding of the role of science in Canadian conservation policy and the roles of conservation practitioners in government agencies and ENGOS and will better prepare students to engage in the Canadian conservation landscape.

EES3001H Professional Scientific Literacy

For decades, environmental scientists have been documenting anthropogenic impacts on the planet's ecosystems. Currently, the weight of scientific evidence showing the severity of the biodiversity and climate crises is immense, and many scientists are advocating for increased governmental engagement with environmental issues. As such, environmental science is closely tied to human valuation of the environment; a linkage that requires one to be able to identify sound science and also understand how science is communicated and used in public policy. This is scientific literacy.

It is increasingly recognized that environmental considerations need to be integrated into all aspects of our economies, a trend that is evidenced by the steady growth of the environmental sector as well as increasing public concern for environmental sustainability. In order to prepare for a career in environmental management or conservation science, it is vital that students develop science literacy skills. Environmental professionals employ a range of tools that fall under the umbrella of scientific literacy. It is the goal of this course that students develop 1) a clear understanding of the scientific process & scientific analysis, 2) the ability to communicate environmental science to different audiences, 3) the ability to think critically about environmental issues, how they are studied, and how they are discussed in public discourse, and 4) the ability to place individual environmental studies and issues in the larger context of environmental and conservation science.

EES3002H Conservation Policy

Through lectures, this course will examine the legislation, regulations, and policies that form the foundation for the conservation of biodiversity in Canada including our international obligations and federal and provincial legislation and policies. To become professional conservation practitioners, students must understand the legislation, regulations, and policies that form the foundation for the conservation of biodiversity in Canada. The course will provide an in-depth examination of conservation policy in Canada from its international obligation (Convention on Biological Diversity) to its federal legislation (Species at Risk Act) and policies (Canadian Biodiversity Strategy) to provincial legislation and policies.

EES3003H Topics in Applied Biodiversity

Taxonomic skills are in increasing demand among the Canadian conservation community. This course will provide students with in-depth taxonomic training. The course will include lecture, lab, and field



components taught by taxonomic experts and will be held over 37.5h during the second last week of April. Students will be required to choose training for one taxonomic group. Students will be responsible for fully attending all components of the course and complete in-class exercises.

[EES3113H Topics in Population and Community Ecology](#)

The field of ecology is rapidly changing and this course will cover recent advances, concepts or controversies in ecology. This course will focus on specific scientific issues using current literature and the learning experience will be augmented by student presentations and discussions. The course will help ensure that students become familiar with current basic ecological concepts. Students who did not take advanced ecology courses during their undergraduate studies will find this course especially attractive. This 'Topics' course is meant to be a flexible offering that focuses on recent advances, concepts and/or controversies in ecology.

Climate Change Impacts & Adaptations Program Director

Professor Karen Smith