

# GEOGRAPHY AND PLANNING

## GPHY 304 – Northern and Arctic Environments



<b>Course Instructor</b>	<b>Dr. Scott Lamoureux</b>	<b>Email:</b> scott.lamoureux@queensu.ca
<b>Office</b>	D126 Macintosh-Corry Hall	
<b>Contact Time</b>	Two X 1 hour lectures per week	<b>Phone:</b> Online access only
<b>Format</b>	Lectures online, Q+A periods, virtual field trips	
<b>Class Assessment</b>	Data analysis #1 20% Quiz (early October) 20% Data analysis #2 20% Quiz (early November) 20% Final quiz (Last week of classes) 20%	

### COURSE OVERVIEW

The goal of this course is to provide students with a background in Arctic System Science and contemporary issues in Arctic. While the emphasis of material will be on Canadian examples and context, in large part due to my experience in this region, the material broadly applies to all polar regions, including the Antarctic. Arctic System Science covers a wide range of natural science topics that are focused on identifying how different components of the Arctic environment function, interact, and are sensitive to changes caused by climate and human activities. The course will present a selection of topics in Arctic System Science, with the assumption that students will have some previous coursework in the natural sciences to support their experience.

### LEARNING OUTCOMES

- To provide a broad scientific understanding of the major processes and systems that operate in polar regions
- Advanced concepts in Earth System Science relating to climate, hydrology, geomorphology, ecosystems and oceanography
- To apply scientific concepts to practical and contemporary issues surrounding resource development, infrastructure and Inuit and First Nation cultures (we will apply these concepts to the experience of northerners, this is not a social science course).
- Extend data analysis skills to work with relevant time series to recognize and interpret processes

### COURSE TOPICS

Introduction to polar regions, Climate, Cryosphere: snow/ice, Permafrost, Periglacial geomorphology, Arctic hydrology, Lakes, ponds and wetlands, Freshwater ecosystems, Terrestrial ecosystems, Oceanography, Coastal systems, Applications in permafrost environments, Long term and Quaternary environmental change, Recent and projected changes

### COURSE READINGS

There is no single book that covers the range of material presented. Therefore, required readings will be based on recent scientific reports and online textbooks that are available from the library.