DTB B122

Snow and ice dominate the Canadian landscape. There is virtually no area in Canada which escapes the influence of snow and ice. We skate on frozen ponds, ski down snow laden mountains, drive through snow blizzards and watch how ice jams in rivers cause rivers to swell and floods to occur. The duration and the thickness of snow and ice increase rapidly northwards, and glaciers are found in mountainous areas and in large parts of the Arctic region. Given that snow and ice impact heavily on the Canadian way of life, this course seeks to understand the dynamics of snow and ice in physical, climatological, and hydrological contexts. This course will examine snow properties, snow cover distribution, glacier hydrology, melt runoff, and ice in its many forms (lake ice, river ice, sea ice, and ground ice). The application of remote sensing and other remote observing systems to understanding the cryosphere will be examined. This course will also examine the implications of climate change on the cryosphere in Canada and beyond.

Class meetings will typically comprise discussions around a topic as initiated by the instructor or used for term project work. Topics covered include:

Components of the cryosphere
State of the cryosphere and climate change
Material properties of water, ice, and snow
Energy exchanges
Snow, freshwater ice, and water availability
Glaciers and Ice Sheets
Melt runoff and floods

Two take home exercises will be given during the course. Further details, including evaluation criteria, will be provided in the class.

Each student is required to conduct a critical review of one peer-reviewed, published, journal article that addresses some aspect of the cryosphere (e.g. techniques or applications). The review will comprise a written component, assessing the article within the context of the literature. It will also comprise a presentation component, where the critical review is presented to the class and followed by a discussion led by the reviewer. You are encouraged to use Power Point or other preferred media to communicate your review and lead your discussion. Students should consider choosing a journal article and related

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Lectures materials, assigned readings, and general course communications will be via CourseSpaces. You are required to come prepared for each lecture. This means you should have read and considered the assigned readings.

Late lab assignments are subject to significant penalties: 20% per day following the due date and time. Exceptions are not permitted except for circumstances involving medical or compassionate reasons. Written verification as proof may be requested at the discretion of the instructor.

and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more information nearer the time but please be thinking about this important activity during the course.