

GEOG 430b: Arctic Field Course

INSTRUCTORS:

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COURSE DESCRIPTION:

This course will develop and apply skills in physical and human geography research in Greenland and the Canadian High Arctic. The Arctic is the region currently suffering from the greatest change due to global climate warming; over the last 100 years, air temperatures in the Arctic have increased twice as fast as lower latitudes (IPCC, 2014). These changes are affecting both the natural and human Arctic environments, often in interconnected ways. In the physical environment, minimum sea ice extent has reduced by 3% every decade, glaciers are losing mass into the ocean, and permafrost is thawing. From a human perspective, local communities are having to adapt to both the changing physical environment and increased external pressures on their communities, for example, the increase of marine vessel traffic, 'last chance tourism' and extractive industries (mining) in the Arctic. This course will examine these changes and the interlinked human and physical environment of the Arctic using multiple cross-disciplinary data analysis methods and facilitated, interactive experiences.

The field portion of this course will take place on the RCGS Resolute ship, on the Classic Northwest Passage and Greenland tour run by One Ocean Expeditions. This route involves spectacular glaciers, polar oceans and dramatically eroded landscapes, along with areas of historical importance and both Inuit and Greenlandic cultural interactions. Students will take part in a variety of on-board tasks and then write a research paper following the end of the cruise.

PRE-REQS:

Students must be at least 3A level and in a Faculty of Environment programme. Students should have taken at least one physical (201, 209) **or** human (202, 203) second year Geography course, or have permission from the instructor.

COURSE FORMAT:

The course is worth 1 unit with 0.5 human geography and 0.5 physical geography. Students are required to take both the human and physical components of the course. However, the chosen research project of the student (see below for assessments) can have either a human or physical geography focus, or a combination of both.

The course will begin with an introduction day in Edmonton. During this day there will be lectures covering some of the human and physical geography background prior to the cruise.

This is followed by a charter flight from Edmonton to Cambridge Bay where we will board the ship. The cruise lasts for 13 days and on the last day we fly from Kangerlussuaq in Greenland to Ottawa. Students will be expected to make their own way to Edmonton and from Ottawa at the beginning and end of the cruise.

Following the cruise, the remainder of the course will be conducted online, on LEARN. The final project will be due on October 25th and this marks the end of the course.

Due to the nature of Arctic cruising, there is uncertainty on exactly where we will be able to go and on what timescale. This depends on weather, sea ice conditions and whether there are any polar bears in the area! We will give on-board presentations as we sail through the Northwest Passage and across to Greenland and will assign tasks along the way. In general the themes will be:

PHYSICAL

Sea ice

Glaciers

Geomorphology

Oceanography

Climate change

HUMAN

Cultural

Development

Economic

Historical

Political

COURSE OBJECTIVES:

By the end of this course students will be able to

1. understand processes and impacts of rapid change in the Arctic from both the physical and human perspective
2. see the links and feedbacks between the environment and cultural experience
3. combine literature review with in-situ data collection to gain a widespread and cross-disciplinary appreciation of physical and human geography methodology
4. demonstrate critical thinking through a policy brief, oral presentation and a research paper using collected and analysed data.

COURSE READINGS:

Readings for this course will be in the form of academic papers posted online. As LEARN will not be running for the course prior to the Fall term we will use an alternative online platform

(TBD). Readings will be posted 2-3 weeks in advance of the course and students will be expected to be familiar with these by the time the cruise starts.

ASSIGNMENTS:

Field project/research paper	40%
Field journals	30%
Policy brief	10%
Sea ice analysis	10%
On-board group presentations	10%

Field project/research paper (40%):

Students will produce a research paper based on an aspect of human and/or physical geography as observed during the cruise. The papers should be a combination of a literature review about the relevant subject and data collected during the cruise itself (or inspired by the content of the cruise). The latter is dependent on where we manage to land and the final route of the cruise and so we will be flexible about the format of this research paper depending on circumstances.

The research paper will be due 6 weeks following the end of the cruise: **11:59pm on October 25th**. The research paper will be no more than 4000 words, not including title, abstract, figure and table captions and references. Term papers should be double spaced and must be referenced correctly with no plagiarism. Papers longer than 4000 words will lose marks. ***Late assignments will lose 5% in grade per day and will not be taken after 5 days past the deadline, unless a valid doctors or councilor note is produced.***

We will provide guidance on suitable research projects. Some examples include:

- Looking at remote sensing data from the past and comparing it with current day locations of glaciers.
- Using ship bathymetry data to compare glacier moraine locations with maps of Laurentide ice sheet fronts.
- Measuring volumes of microplastics in ocean water as we move through the NW passage to Greenland.
- Assessing opportunities and challenges for northern communities in the face of rapid change using interview techniques
- ‘Last chance tourism’: media portrayal versus cruise ship passengers’ experiences

Field journals (30%):

Students will be asked to bring two notebooks with them and keep field journals of their journey on the ship. This should include daily observations of both the human and physical geography environment. There will be tasks to complete on board which the students will be asked to write up in their journals. The tasks depend on the route/weather/sea ice conditions etc. but may involve for example, examining 18th Century Whaling Log journals of similar routes, recording evidence of glacial geomorphology features, notes of discussions with Inuit community residents, recording iceberg size and features, among others. As part of this documentation we will also ask students to write a blog post each that we can post online from the ship. More instructions on the field notebook content will be provided prior to the cruise.

Policy brief (10%): Students will conceptualize and develop an objective policy brief about a physical or human geography issue. The brief will be aimed at government policymakers and others who are interested in formulating or influencing policy. Students will write a concise summary of a particular issue, potential policy options to deal with it, and some recommendations on the best option. The policy brief should: ►Provide enough background for the reader to understand the problem. ►Convince the reader that the problem must be addressed urgently. ►Provide information about alternatives. ►Stimulate the reader to make a decision. The brief will be due on **September 27th** two weeks following the end of the cruise.

Sea ice analysis (10%): Students will be provided with daily maps of sea ice extent while we are onboard and will analyse this compared to sea ice extent and thickness in past years. Students will be asked to analyse and discuss this over longer timescales and the timescale of the cruise along with the drivers for sea ice changes. The sea ice analysis will be due on **September 27th** two weeks following the end of the cruise.

On-board group presentations (10%):

Students will be divided into groups of 3 and asked to give a 15 minute presentation on an aspect of the cruise (this can be physical or human geography or a combination). The presentations will likely occur on day 9 when we cross from Baffin Island to Greenland but is subject to change.

PLEASE NOTE:

Note the following for essays and assignments: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin® in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit the alternate assignment.

Missing Assignment: If you miss an assignment deadline due to a valid medical reason, personal or family emergency, etc., contact me immediately, and promptly obtain a University of Waterloo medical or counselor's note explaining the reason for your absence, degree of incapacitation, dates covered by the note, etc. Please provide the original of the note to me in person.

COURSE SCHEDULE:

16th August: Students must provide the course instructors with their TCPS2 Core Research Ethics Tutorial Certificate. Please refer to the University Office of Research Ethics website for research with human participants <https://uwaterloo.ca/research/office-research-ethics/research-human-participants>. Students must also provide a completed emergency form to the course instructors as well as to University of Waterloo International

29th August: Students to arrive in Edmonton by early afternoon. Afternoon: introduction to the course.

30th August: briefing with One Ocean. Introduction to human and physical geography content of the course.

31st August: One Ocean charter flight from Edmonton to Cambridge Bay, Nunavut. Board the RCGS Resolute and set sail.

12th September: One Ocean charter flight from Kangerlussuaq, Greenland to Ottawa.

13th September: Students independently make their way back to Waterloo.

27th September: Policy brief and sea ice analysis due

25th October: Research paper due.

Intellectual Property

Students should be aware that this course contains the intellectual property of their instructor and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository). Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights. Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. The University's guiding principles on academic integrity can be found here:

<http://uwaterloo.ca/academicintegrity/>

ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office specifically for students:

<http://uwaterloo.ca/academicintegrity/Students/index.html>

Students are also expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions. Students who are unsure whether an action constitutes an offense, or who need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. Students may also complete the following tutorial: <https://uwaterloo.ca/library/get-assignment-and-research-help/academic-integrity/academic-integrity-tutorial>

When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline,

<https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71>

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance: <https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-70>

Note for students with disabilities: AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Mental Health: The University of Waterloo, the Faculty of Environment and our Departments consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. **Please note that help is available.** Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services <http://www.uwaterloo.ca/counselling-services> is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

Religious Observances: Student needs to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70 - Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt please contact your Undergraduate Advisor for details.

Appeals: decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 – (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm

Unclaimed assignments: Unclaimed assignments will be retained until one month after term grades become official in Quest. After that time, they will be destroyed in compliance with UW's confidential shredding procedures <http://www.adm.uwaterloo.ca/infostor/Confidential%20Shredding%20procedures%202008.htm>

Communications with Instructors: All communication with students must be through either the student's University of Waterloo or University of Ottawa email account or via Learn. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.

Recording lectures:

- Use of recording devices during lectures is only allowed with explicit permission of the instructor of the course.
- If allowed, video recordings may only include images of the instructor and not fellow classmates.
- Posting of videos or links to the video to any website, including but not limited to social media sites such as: Facebook, Twitter, etc., is strictly prohibited.