Research Methods and Ethics in the Arctic
ENVI 3500 (4 Credits)

Iceland: Climate Change and the Arctic

This syllabus is representative of a typical semester. Because courses develop and change over time to take advantage of unique learning opportunities, actual course content varies from semester to semester.

Course Description

In this seminar, students are introduced to recent research on climate change. Students become familiar with the methodologies employed in natural and social science research on climate change as well as in renewable energy and sustainability studies. Students select and analyze relevant issues surrounding climate change in the Arctic, including its impact on ecosystems and human communities, in consultation with program faculty. Students work to research and identify an existing problem related to climate change and provide innovative solutions or answers to the identified problem. This seminar gives students the opportunity to engage on a deeper level with the topics covered in the thematic seminars and to develop their academic and research skills. Support is provided throughout the seminar by program faculty, particularly in aiding students in finding resources and project advisors in Iceland for those who desire to work with an advisor.

Learning Outcomes

Upon completion of the course, students will be able to:

- Utilize various research methodologies and tools for field-based research;
- Clarify features of the Iceland context affecting field studies, including methods of coping with ethical and logistical constraints during student research activities;
- Understand the Institutional/Local Review Board (IRB/LRB) processes and highlight the ethical issues involved in working with human subjects as research participants in Iceland;
- Demonstrate ability to work constructively on an independent project;
- Identify a research topic and research methodology that is realistic given time and resource constraints and that is ethically appropriate in Iceland;
- Synthesize methods and tools of an independent project or contribution to a collaborative small group project in a research proposal.

Language of Instruction

This course is taught in English, but students will be exposed to vocabulary related to course content through in-country expert lectures and field visits in a wide range of venues and regional locales.

Instructional Methods
SIT's teaching and learning philosophy is grounded in the experiential learning theory developed by Kolb (1984; 2015) and informed by various scholars, such as Dewey, Piaget, Lewin, among others. Experiential learning theory recognizes that learning is an active process that is not confined to the formal curriculum; "knowledge is created through the transformation of experience" (Kolb, 2015, p. 49). Learning involves both content and process. Learning is holistic and happens through various life experiences upon which students draw to generate new ways of knowing and being. Learning involves a community and is a lifelong endeavor. Learning is transformational. The suggested four step-cycle of a *concrete experience*, *reflective observation*, *abstract conceptualization*, and *active experimentation* embedded in the experiential learning model is not linear and might not always happen in that specific order, as any learning is highly context dependent. These stages of taking part in a shared experience; reflecting on that experience by describing and interpreting it; challenging their own assumptions and beliefs to generate new knowledge; and ultimately applying new knowledge, awareness, skills, and attitudes in a variety of situations and contexts are important for students to engage in to become empowered lifelong learners.

Course Schedule
Students will be provided a detailed course schedule during orientation on the program. Please be aware that topics and excursions may vary to take advantage of any emerging events, to accommodate changes in our lecturers' availability, and to respect any changes that would affect student safety. Students will be notified if this occurs.

Module 1: Positionality, Climate Change, and Culture
This module addresses the intricate and mutual interaction between climate change and the social and cultural environment in the Arctic and subarctic. It focuses on ways in which the researcher's positionality can impact data collection and representation of the host culture. Students are introduced to ways in which communities in the Arctic and subarctic are impacting and adapting to climate change. Students also learn about community involvement in research design and ethics of conducting research interviews.

Session 1: Impact of Climate Change on Communities and Culture
This session provides an overview of the impact of climate change on communities in the Arctic and subarctic. In particular, the session focuses on the vanishing glaciers and the impact on local ecosystems and cultural life in the Arctic.

Required Reading:
Katz, C. (2013). Iceland's Vanishing Ice. *The Daily Climate*. Retrieved from: http://www.dailyclimate.org/tdc-newsroom/2013/12/iceland-ice-climate
Jóhannesson, T. et al. (2006). The impact of climate change on glaciers and glacial runoff in the Nordic countries. Retrieved from: http://www.raunvis.hi.is/~sg/ce-glaciers-eabstr.pdf

Price, C. (2013). Climate Change Impacts and Adaptations in Iceland. Retrieved from: https://www.youtube.com/watch?v=nJ_yipz3vqU

Session 2: Research and the Debate on Climate Change
This session is focused on the contradictory interpretations regarding the causes and impacts of climate change and the role of scientists in ensuing conflicting opinions. The purpose is to ask the students to reflect on their own positionality and make them aware of the ways positionality shapes the research question, relation with the research participants, approach in data collection, data processing, and the representation of research participants in the final project.

Required Reading:
Mathieson, K. (2014). Brian Cox: scientists giving false sense of debate on climate change. Retrieved from: http://www.theguardian.com/environment/2014/sep/03/brian-cox-scientists-climate-change
Sultana, F. (2007). Reflexivity, Positionality and Participatory Ethics: Negotiating Fieldwork Dilemmas in International Research. In *ACME*: *An International E-Journal for Critical Geographies*, 6:3, 374-385.

Session 3: Adaptation to Climate Change in Human Communities
This session provides a guide to writing about community climate change adaptation. Types of case studies of community climate change adaptation include getaway studies, worked examples, process case studies, and learning histories cases. The session also discusses the criteria for the selection of the type of case study to write and the benefits and limitations of community climate change adaptation case studies.

Required Reading:
Penney, J. (2011). Guide to Writing Community Climate Change Adaptation Case Studies. Retrieved from: http://www.cleanairpartnership.org/files/Guide%20for%20Writing%20Community%20Adaptation%20Case%20Studies%20Final%20April%202011.pdf
United Nations Educational, Scientific, and Cultural Organization (UNESCO). (2009). Climate change and Arctic Sustainable Development: scientific, social, cultural, and educational challenges. UNESCO. Paris. 376 (Section 3: Community-Level Impacts and adaptation).

Session 4: Community Involvement in Research Design and Development
This session discusses the importance of community engagement in research design and development. The session focuses on case studies of community-environment research in the Arctic, ethical consideration of community involvement, and key considerations for involving and engaging Arctic communities in collaborative research projects.

Required Reading:
Pearce, T. (2009). Community collaboration and climate change research in the Canadian Arctic. *Polar Research*, 28:10-27. Retrieved from: http://www.polarresearch.net/index.php/polar/article/viewFile/6100/6779

Session 5: Frontiers in Climate Change Research
This session is devoted to the discussion of the current and emerging research questions, methods, and technologies on climate change in the Arctic. The focus is on a holistic and interdisciplinary systems approach to the impact of climate change on ecosystems.

Required Reading:
National Research Council. (2011). *Frontiers in understanding climate change and polar ecosystems: Report of a workshop*. Washington, DC: National Academies Press. Retrieved from: http://www.nap.edu/catalog/13132/frontiers-in-understanding-climate-change-and-polar-ecosystems-summary-of

Module 2: Methods in Natural Science Research
This module is focused on research methods in the natural sciences. The module addresses approaches and methodologies students are likely to use for their independent projects. In particular, the focus is on climate data analysis, data collection, and mathematical modeling. Besides classroom sessions, students will also carry out field assignments.

Session 1: Introduction to Research Methods in Climate Science
This session provides a general introduction to the science of climate change, drawing attention to the latest research and evolving pattern of scientific data that has emerged on climate in recent years. The session also rehearses possible research questions that the students could take up for their projects.

Required Reading:
Almlund, P., P. H. Jespersen, and S. Riis. (2012). *Rethinking Climate Change Research: Clean-Technology, culture and communication.* Burlington, VT: Ashgate.

Session 2: Data Collection and Field Research Techniques
This session focuses on relevant field techniques in research on climate change in the Arctic. The session covers a general discussion of the Icelandic habitat where students will undertake fieldwork and relevant questions in climate change protection. The session also addresses tools and methods used to collect data for the measurement of changes in sea ice.

Required Reading:
Eicken, H. et al. (Eds.). (2010). *Field Techniques for Sea Ice Research*. Fairbanks: University of Alaska Press.

Session 3: Modeling
This session focuses on the use of mathematical and statistical techniques applied to the understanding and analysis of climate systems. The session covers the use of mathematics in the analysis of energy balance, temperature distribution, ice caps, and glaciation periods.

Required Reading:
Kaper, H. and Engler, H. (2013). *Mathematics and Climate Change*. Society for Industrial & Applied Mathematics, U.S.

Session 4: Designing a Research Project
This session provides a practical introduction on how to design and develop a research project. It involves the formulation and refinement of the research question(s), the description of the problem, preparation of a literature review with the use of critical and analytical methods, and the integration of interview quotes into the research project. The session also covers project management basics and the preparation of an HSR application.

Required Reading:
Hurlbert, S. H. (1984). Pseudoreplication and the design of ecological field experiments. *Ecological Monographs*. 187-11.
Silverman, D. (2005). Writing a research proposal. *Doing Qualitative Research.* 139–146. Retrieved from**: http://www.uk.sagepub.com/managementresearch/Easterby-Smith%20Online%20Reading%20Links/Chapter%202/Silverman%20Doing%20Qualitative%20Research%20pp139-146.pdf**

Module 3: The Ethics of Climate Science and Communicating Climate Change
This module addresses the ethics of research on climate change and the Arctic. The sessions focus on environmental ethics, ethics and sustainability, and the ethics of conducting research in observance of the value systems of host and academic communities. The module also addresses the ethics of communicating climate change.

Session 1: Ethics in Conducting Environmental Research
This session asks the students to reflect and articulate potential ethical implications of their research on Arctic ecosystems. Some of the questions the students need to address include the relevance of their research to the existing context, expected impacts of the research on species and habitat, and the contribution of the project to climate protection.

Session 2: Ethics and Sustainability
This session is focused on the ethics of doing research on sustainability. Sustainability is premised on the reconstruction of the human community as an integrated part that is interdependent on the ecosystem and should therefore be construed on ethical foundations. The session seeks to encourage/challenge students to think through their projects in the larger framework of sustainable ecosystems.

Required Reading:
Becker, C. (2012). *Sustainability Ethics and Sustainability Research*. New York: Springer. Chapters 1 and 3.

Session 3: Interpreting Data and Communicating Climate Science
Climate change is a complex topic that brings together expertise from different disciplines. This session introduces students to the fundamentals of effective communication about climate change. The session also addresses the role of data interpretation and communication in shaping public views about climate change.

Required Reading:

Pidgeon, N.F and Fischhoff, B. (2011) The role of social and decision sciences in communicating uncertain climate risks. *Nature Climate Change*. 1, 35–41.

Poortinga, W., Spence, A., Whitmarsh, L. Capstick, S. & Pidgeon, N.F. (2011). Uncertain climate: an investigation into public skepticism about anthropogenic climate change. In: *Global Environmental Change* 21 (3), 1015–1024.

Session 4: Research Project in Arctic Climate Protection

This session focuses on the objectives and ethics of student projects in Arctic climate protection. It addresses the importance of learning from the local community in the design and development of the project, program expectations from independent and group projects, assessment rubrics for both independent and group projects, and the need to develop projects that are innovative, ethical to conduct, and inscribed in ongoing academic and scientific research on climate change and the Arctic.

Assignments and Evaluation

Assignment Descriptions and Grading Criteria

1) Arctic Climate Change Presentation (45%)

Students give a 15-minute oral presentation on an Arctic climate change study of their choice. Presentations include detailed methodology, including all sampling methods and analyses.

2) Research Project in Climate Change Proposal (45%)

Students submit a research proposal for an independent project in which they articulate clearly the research problem, research question, methodology, ethics, review of the literature, and annotated bibliography. Group project proposals should include smaller independent projects for each team member.

3) Participation (10%)

This includes active involvement in lectures, readings, discussions, and excursions using the following criteria:

- Attendance - promptness to class and positive presence in class.
- Active Listening - paying attention in class and during field excursions, asking appropriate questions, showing interest and enthusiasm (this includes body language), entertaining contradictory perspectives, taking notes.
- Involvement in Class Discussions - either in small or large groups, sharing knowledge. This means challenging yourself to speak up if you usually don't, and also means allowing others to speak if you are a person who tends to dominate class discussions.
- Group Accountability – positive participation in the group during field excursions and classes; not keeping others waiting.
- Displaying Respect – culturally appropriate interaction with hosts, SIT program staff, SIT lecturers and communities.

Assessment

Instructions and rubrics will be provided for all assignments.

Research/Discussion Presentation - 45%
Research Project in Climate Change Proposal - 45%
Participation - 10%

Attendance and Participation

Due to the nature of SIT Study Abroad programs, and the importance of student and instructor contributions in each and every class session, attendance at all classes and for all program excursions is required. Criteria for evaluation of student performance include attendance and participation in program activities. Students must fully participate in all program components and courses. Students may not voluntarily opt out of required program activities. Valid reasons for absence – such as illness – must be discussed with the academic director or other designated staff person. Absences impact academic performance, may impact grades, and could result in dismissal from the program.

Late Assignments

SIT Study Abroad programs integrate traditional classroom lectures and discussion with field-based experiences, site visits and debriefs. The curriculum is designed to build on itself and progress to the culmination (projects, ISP, case studies, internship, etc.). It is critical that students complete assignments in a timely manner to continue to benefit from the sequences in assignments, reflections and experiences throughout the program.
Example: Students may request a justified extension for one paper/assignment during the semester. Requests must be made in writing and at least 12 hours before the posted due date and time. If reason for request is accepted, an extension of up to one week may be granted at that time. Any further requests for extensions will not be granted. Students who fail to submit the assignment within the extension period will receive an 'F' for the assignment.

Grading Scale

94-100%   A
90-93%   A-
87-89%   B+
84-86%   B
80-83%   B-
77-79%   C+
74-76%   C
70-73%   C-
67-69%   D+
64-66%   D
below 64   F

Program Expectations

- Show up prepared. Be on time, have your readings completed and points in mind for discussion or clarification. Complying with these elements raises the level of class discussion for everyone.
- Have assignments completed on schedule, printed, and done accordingly to the specified requirements. This will help ensure that your assignments are returned in a timely manner.
- Ask questions in class. Engage the lecturer. These are often very busy professionals who are doing us an honor by coming to speak.
- Comply with academic integrity policies (no plagiarism or cheating, nothing unethical).
- Respect differences of opinion (classmates', lecturers, local constituents engaged with on the visits). You are not expected to agree with everything you hear, but you are expected to listen across difference and consider other perspectives with respect.
- Storing Your Work: Keep several copies of your work as back up and keep one copy accessible to you through an online forum, such as an attachment in your email, the course learning management system, or cloud-based storage. This way your work will always be available to despite technical issues. Lost files, deleted drives, or computer crashes are not excuses for late, missing work.
- Personal Technology Use: Cell phones and other personal electronics can be used for taking notes and other class activities. Off-task usage is not acceptable. You may be marked as absent for habitually using them for something other than classroom activities.
- Content Considerations: Some texts and activities you will encounter in this course delve into sensitive topics that may be emotionally and intellectually challenging. Our classroom is a space where we can engage with challenging ideas, question assumptions, and navigate difficult topics with respect and maturity. As possible, I will flag content and activities that are especially graphic or intense, so we are prepared to address them soberly and sensitively. If you are struggling to keep up with the work or participate in the course because of the nature of the content and activities, you should speak with me and/or seek help from counseling services.
- Classroom recording policy: To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

SIT Policies and Resources
Please refer to the [SIT Study Abroad Handbook](#) and the [Policies](#) section of the SIT website for all academic and student affairs policies. Students are accountable for complying with all published policies. Of particular relevance to this course are the policies regarding: academic integrity, Family Educational Rights and Privacy Act (FERPA), research and ethics in field study and internships, late assignments, academic status, academic appeals, diversity and disability, sexual harassment and misconduct, and the student code of conduct.

Please refer to the SIT Study Abroad Handbook and SIT website for information on important resources and services provided through our central administration in Vermont, such as [Library resources and research support](#), [Disability Services](#), [Counseling Services,](#) [Title IX information](#), and [Equity, Diversity, and Inclusion](#) resources.