

## Research Methods and Ethics in the Arctic

ENVI 3500 (4 Credits / 60 hours)

### 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.*

#### 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

The *Research Methods and Ethics in the Arctic* seminar comprises 60 hours of instruction (4 credits). 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.

#### 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 Iceland and Finland. 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 Iceland and Finland 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 Iceland and Finland. 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](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. Students also learn about experiences from program partners in Finland.

##### *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.

### **Evaluation and Grading Criteria**

#### Description of Assignments:

#### 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.

#### 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.

#### Participation (10%):

Participation includes class attendance, participation in class discussions, and field excursions.

#### Assessment:

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

#### 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

## Expectations and Policies

- 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 according 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 we engage with on site 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.

**Academic Policies:** SIT prides itself on providing students with an experientially based program; we hold ourselves, and our students, to the highest of academic standards. Students are asked to refer to the **SIT Study Abroad Handbook** for policies on academic integrity, ethics, academic warning and probation, diversity and disability, sexual harassment and the academic appeals process.

**Disability Services:** Students with disabilities are encouraged to contact Disability Services at [disabilityservices@sit.edu](mailto:disabilityservices@sit.edu) for information and support in facilitating an accessible educational experience. Additional information regarding SIT Disability Services, including a link to the online request form, can be found on the Disability Services website at <http://studyabroad.sit.edu/disabilityservices>.