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Environmental Research Methods and Ethics

ENVI-3500 (3 credits)

Argentina: People, Environment, and Climate Change in Patagonia and Antarctica

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

The *Environmental Research Methods and Ethics* course is an introduction to field research and research methods in climate change, ecology, and conservation. The course prepares students to study and practice research effectively in a nontraditional and cross-cultural environment. Course content emphasizes understanding the human environment context as fundamental to knowing ecosystems, climate change, and people through fieldwork. The course introduces both ecological and anthropological field study techniques through the integration of field observation, activities and interviews. Students gain familiarity with recordkeeping, scientific analysis, interpretation, and presentation based on primary sources. Through excursions and field assignments the course introduces and critically employs scientific and social scientific methods appropriate to the program theme and for feasible and ethical research. This course runs concurrently with the thematic seminar *Socio-ecological Dynamics and Conservation in Southern Patagonia and Antarctica* and *Climate Change and Marine Biology in Southern Patagonia and Antarctica*.

All students will participate in an overview of research design and appropriate methodological approaches to research on climate change, comparative ecology and conservation. Ethical considerations related to conducting research will be discussed and the Institutional Review Board (IRB) process necessary for student research clearance will be introduced. The overall aim is to help students hone their experience-based learning processes and acquired research skills and prepare them for the development of an Independent Study Project (ISP).
This is a project-based learning course, aimed at developing comprehensive and applied knowledge in intercultural contexts, with a focus on ethical, theoretical, and methodological aspects, as well as the effective communication of results.

Learning Outcomes

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

- Demonstrate understanding of field based learning in Southern Patagonia and Antarctica including issues of risk minimization and safety in a field setting;

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- Collect, analyze, integrate, and report social and ecological data
- Demonstrate familiarity with key conceptual tools and skills for field research in climate change, ecology, conservation and society
- Master basic science and social science methods to study climate change and human impacts and adaptation
- Discuss the importance and relevance of ethics in research conducting field studies in a safe and responsible manner in natural and human built environments.

Language of Instruction
This course is taught in Spanish, though some subjects may be introduced in English. Students will be exposed to vocabulary related to course content through in-country expert lectures and field visits to 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.

Assignments and Evaluation
Experiences in and outside of the classroom are integrated into subsequent preparations for independent study projects. Our sessions address many of the unique challenges faced in the process of information gathering and field study in Patagonia. Through structured activities, case studies, readings and discussions we will investigate natural and social science field methodologies and their appropriateness for fieldwork in different places in Patagonia. Various methods of field study will be discussed and tested during the semester.

<u>Assignment Descriptions and Grading Criteria</u>

Assignments must be completed on time. Grades will be awarded for clarity, cohesiveness, organization, content, depth of analysis, and the appropriate use of sources.

1) Climate Change Project (50%)

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This is a team research project to be developed before the ISP period (see due date on calendar). This assignment simulates a real-life research experience with field studies, a science **PAPER**, and an **ORAL** presentation.

The objective is to explore the knowledge and beliefs of a selected group regarding a specific climate change-related topic by creating a survey. Groups and topics are selected during the first weeks.

The **written work** (about 10 pages single space) follows a science format, including **Introduction, Materials & Methodology, Results, Discussion, and Bibliography**. Also includes data tables, science graphs, pictures, and any related science aid.

The **oral presentation** (15 minutes max.) is usually provided with a Power Point / Google Slides / Prezi / slidesgo.

Breakdown:

- 7.5% - 3 partial submissions
- 17.5% - Oral Presentation
- 25% - Paper

2) Public Science Communication Project: Antarctic Climate Change (20%)
Students, working collaboratively in groups and guided by an outreach specialist, will undertake in-depth research to collectively prepare and deliver an oral presentation on climate change. This presentation is scheduled to unfold during the expedition cruise to Antarctica, with the intended audience consisting of passengers from diverse nationalities.

3) ISP Proposal (10%)
Assesses the student's ability, independence, and maturity in developing a dependable plan. Usually **3-5** pages single spaced, in Spanish.
Attention should be given to the clarity of your objective(s), your hypothesis (if any), and your plans (methodology). Realistic timing is another key element of the proposal.
Important: do in-depth research on papers from other researchers (Citations and Bibliography).
All students must develop a research proposal. The research proposal should address a theme related to the program. The proposal should include a research question, research objectives, theoretical framework, methodology, and comply with the ethical standards learned throughout the course. IRB/LRB forms are also to be submitted.

4) General Performance (10%)
Assessment of overall academic performance, preparation for classes, and quality of work throughout the semester.

5) Participation (10%)
This includes active involvement in lectures, readings, discussions and excursions using the following criteria:

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- 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

- 10% ISP Proposal
- 50% Climate Change Project
    - 7.5% - 3 partial submissions
    - 17.5% - Oral Presentation
    - 25% - Paper
- 20% Public Science Communication Project
- 10% General Performance
- 10% Participation

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.

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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.
- 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.

SIT Policies and Resources

Student research (Independent Study Project) is a product of field work and as such students have an obligation to assess both the positive and negative consequences of their field study. Ethical field work, as stipulated in the SIT Statement of Ethics, results in products that are shared with local and academic communities; therefore, copies of ISPs are returned to the sponsoring institutions and the host communities, at the discretion of the institution(s) and/or community involved. World Learning/SIT Study Abroad may archive, copy, or convert the ISP for non-commercial use, for preservation purposes, and to ensure future accessibility. World Learning/SIT Study Abroad may archive ISPs in the permanent collection at the SIT Study Abroad local country program office and/or at any World Learning office. World Learning/SIT

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Study Abroad has a non-exclusive, perpetual right to store and make available, including electronic online open access, to the ISP. Students retain all ownership rights of the ISP product and retain the right to use all, or part, of my project in future works. Please refer to the Student Handbook or the Access, Use, and Publication of ISP form.

If the research has been funded by a U.S. government agency, or if the student plans to take this research back to the home school or community for further dissemination, then the student may be required to follow standards from their home institutions in addition to the Local Review Board and those of the Office for Human Research Protections, with which SIT is registered. For applications that require a full review, the academic director will forward any questions or concerns that cannot be resolved at the program level (through the Local Review Board) to SIT's Institutional Review Board.

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, Accessibility Services, Counseling Services, Title IX information, and Equity, Diversity, and Inclusion resources.

Course Schedule

**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: Session One: Context, Cultural Adjustment, and Experiential Learning

This module introduces students to field research in a study abroad context in Latin America in general and Patagonia and the Southern Ocean, specifically. Students consider representations of Latin American environments and communities and the ways in which standpoints shape approaches to Patagonia, ecosystems, and research. Discussions in Spanish and English regarding taboos, power, social hierarchy, gender, age, food, dress, etc. are accompanied with field-based activities that enable first-hand experience with cultural norms at homestays, in urban and rural areas, at the market, etc. In this module students reflect on their positionality and the role of outside researchers within SIT's experiential pedagogy. Furthermore, the module introduces students to strategies for effective living in Patagonia.

Assigned Readings:

- Bridges, E. L., & Natalie, P. D. (2010). Uttermost part of the Earth: a history of Tierra del Fuego and the Fuegians. New York, NY: Rookery. [Selected chapters.]

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- Datesman, M. K., Crandall, J. A., & Kearny, E. N. (2014). American ways an introduction to American culture. White Plains, NY: Pearson. [Selected chapters.]
- Gochenour, T. E. (1993). Beyond Experience: The Experiential Approach to Cross-Cultural Education. Second Edition. Intercultural Press. [The Green Banana by Donald Batchelder.]
- Hall, E. T. (1978). Más allá de la cultura. Barcelona /etc.: Gili.

Module 2: Field Study Design and Contextualization
This module introduces students to field study design and the norms and expectations of primary data gathering in Patagonia. The module helps students to internalize the experiential learning process and to apply a nuanced understanding of the local context to the research cycle in preparation for independent research. Practical strategies aimed at accomplishing this begin with participant observation, ethnographic approaches and the role of language in fieldwork, and learning how to record notes in the field. Seeing through local eyes and continuous reflection enhances contextual understanding and guides student expectations toward designing feasible projects.

Assigned Readings:
- Bridges, E. L., & Natalie, P. D. (2010). Uttermost part of the Earth: a history of Tierra del Fuego and the Fuegians. New York, NY: Rookery. [Selected chapters.]
- Glesne, C. (2016). Becoming qualitative researchers: an introduction. Boston: Pearson. [Selected chapters.]
- Diversi, M., Moreira, C., & Lincoln, D. Y. (2016). Betweener Talk Decolonizing Knowledge Production, Pedagogy, and Praxis. Walnut Creek: Taylor and Francis. [Selected chapters.]

Module 3: Introduction to Social Science Methods
This module builds on the previous ethnographic approach in field study design and contextualization to include questionnaires, interviewing techniques, and group discussions, which are done with fishing families in the Beagle Channel. Structured, semi-structured, and key stakeholder interviews are performed on natural resource topics chosen by SIT students in collaboration with local students. Further understanding of resource use at the local level is achieved through Participatory Research Appraisal (PRA) alongside Patagonia student cohorts during the village stay. Teams of Patagonian and SIT students work with village leaders to produce participatory community maps, resource flow diagrams, household activity budgets, and seasonal agricultural calendars for their Natural Resource Portfolio assignment. A market analysis rounds out the array of social science techniques. Each method is analyzed through critical reflection of its utilities and shortcomings.

Assigned Readings:
- Bridges, E. L., & Natalie, P. D. (2010). Uttermost part of the Earth: a history of Tierra del Fuego and the Fuegians. New York, NY: Rookery. [Selected chapters.]
- Creswell, J. W. (2018). Research design: Qualitative, quantitative, and mixed methods approaches. 5th Edition. Thousand Oaks (Calif.): SAGE. [Selected chapters.]

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- Glesne, C. (2016). Becoming qualitative researchers: an introduction. Boston: Pearson. [Selected chapters.]
- Diversi, M., Moreira, C., & Lincoln, D. Y. (2016). Betweener Talk Decolonizing Knowledge Production, Pedagogy, and Praxis. Walnut Creek: Taylor and Francis. [Selected chapters.]

Module 4: Introduction to Natural Science Methods
This module introduces students to designing and carrying out a field study using natural science techniques. Sampling strategies for a variety of ecological census techniques are reviewed for different target species. Botanical methods focuses on species discovery and minimum area, inventories using Gentry plots, Point Center Quarter (PCQ) for habitat and species association, vertical forest structure using Gauthier's method, and herbarium collection methods. Students are introduced to research in Coastal Environments, specifically the Southern Ocean. Successional theory to measure marine ecosystem health is introduced as well as research techniques in Oceanography through the study of waves, marine currents, fronts, and tides. Students will also be introduced to the use of remote systems (GIS, images, remote sensing), mobile platforms (boats), probes sampling and monitoring of the marine environment through the use of physical variables like plankton and benthos as well as laboratory testing.

Research on land resources is also carried out looking at the regions chemical and biological variables finally students are introduced to technique in the study of Sea and Coastal Environments intruding technique in Marine and Coastal Geomorphology and Glaciers. Local researchers lay theoretical foundations, while it is the students' responsibility to design and carry out their studies, analyze and interpret their data, and reach conclusions based on the evidence. Oral and written presentations are done in Spanish.

Assigned Readings:
- Barnard, C. J., Gilbert, F., & McGregor, P. (2017). Asking questions in biology a guide to hypothesis testing, experimental design and presentation in practical work and research projects. Harlow, England: Pearson. [Selected chapters.]
- Bolstad, P. (2016). GIS fundamentals: a first text on geographic information systems. Acton, MA: XanEdu. [Selected chapters.]
- Sutherland, W. J. (2006). Ecological census techniques: a handbook. Cambridge: Cambridge University Press. [Selected chapters.]

Module 5: Finding the Best Mix of Methods
This module focuses on making the most out of data collected through different methods and forms of analysis, cross-referencing, and triangulation. An overview of qualitative and quantitative methods conducted in conjunction with fieldwork on various assignments enables students to compare and contrast qualitative and quantitative data sets and respective modes of analysis and data presentation. After engaging in different types of natural and social science techniques, students are challenged to make the strongest case possible in answering their research questions based on available results without overstating their conclusions. The

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best mix of methods allows students to suggest policy guidelines for conservation strategies and development plans appropriate to the needs and rights of local actors.

Assigned readings: Natural and social science methods previously listed in their respective modules.

Module 6: Ethics in Fieldwork for Research
Understanding local livelihoods and cultural practices is essential to all field studies. Issues concerning globalization, modernization/development, livelihoods, gender, political economy, rights, power & privilege and reproductive rights are viewed in local Argentinian cultural contexts while adhering to strict ethical guidelines. Case studies in ethics are discussed to emphasize the importance of cultural sensitivity. Working with human subjects and the role of the Local Review Board are meticulously reviewed to ensure adherence to SIT policy on ethical research.

Assigned Readings: SIT Policy on Human Subject Research

Module 7: The ISP Conception to Completion
This module takes the student through the independent study project research cycle from the beginning conceptual phase through defining questions and understanding the surrounding issues to conducting literature reviews and developing appropriate methodologies for chosen subjects. Students see a variety of past projects and critique a former student's project to set the stage for exploring their own interests. Based on personal and professional objectives, topics are chosen, contacts are facilitated, and students engage in the formal process of proposal writing. Reflection is a critical aspect of the process culminating in recommendations for future study. Students carefully navigate the proposal process in observance of local norms and practical feasibility. The Local Review Board approves successful proposals after careful consideration of working with human subjects, appropriateness, and feasibility to complete a project in the allotted time. Issues related to time and budget management, travel logistics, cultural informants, and independent project advisors are fully discussed. The core requirements of the written and oral presentations are laid out in relation to the ISP assessment rubric.

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