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SYLLABUS

Environmental Research Methods and Ethics

ENVI-3500 (3 credits / 45 hours)

SIT Study Abroad Program:

Ecuador: Comparative Ecology and Conservation

PLEASE NOTE: This syllabus represents a recent 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 Research Methods and Ethics seminar (RME) introduces students to the conceptual and practical tools for gathering primary data and the knowledge and skills that are essential to forming constructive relationships with organizations and/or individuals, which are necessary for completing an academic project in the science and cultural context of Ecuador. In particular, the course enhances gathering, recording, and analyzing primary data; and writing a scholarly academic report. The course also pays particular attention to US higher education ethical considerations that guide primary data collection and how these could be translated within the local cultural and scientific context of Ecuador. Broadly, the seminar introduces students to both qualitative and quantitative approaches of ecological and biological field research.

The main emphasis of the seminar is on the development of empirical tools and ethics of interactive research skills involving the collection of primary data. The seminar includes lectures on qualitative methods of science research, development of a research proposal, and preparation of an application for review of research with human subjects. All students will participate in an overview of research design and methodological approaches to program themes. Ethical considerations related to conducting research will be discussed. The overall aim is to help students hone their experience- based learning processes and prepare them for the development of an Independent Study Project (ISP), which is largely based on the data gathered from primary sources.

Learning Outcomes

The Research Methods and Ethics course comprises 45 hours. Upon completion of the course, students will be able to:

- Show an acute sense of positionality and perspective and operate independently, using cultural sensitivity, language skills, and local networks of trust built over the course of the semester
- Demonstrate awareness of appropriate methods and ethics used in field research in critical global issues

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- Analyze and process primary data gathered in the field and draw valid interpretations and conclusions
- Produce an Independent Study Project that is in strict observance of ethical academic standards and local values and that includes a research question, sample review of the relevant literature, outline of the research methods, and anticipated ethical challenges and ways of addressing them.

Language of Instruction

The academic content of this course is taught both in Spanish and English; all orientation and logistical issues are provided in English.

Course Schedule

Module 1: Environmental, Ecological & Biological Field Techniques

This module focuses on field techniques currently applied by the international science community for the development of environmental, ecological and/or biological investigations, including statistical methods for proper data analysis. The module is based on a hands-on approach, complemented by field activities during the educational excursions.

Sessions:

- Baseline Environmental Techniques: Soil and Water Field Techniques
- Forestry Field Techniques: Quadarts & Transects; Tree Density, Biodiversity, Basal Area, Biomass, Forest Profile and Mapping; Forestry Measurements: DBH, Tree Height (clinometer) & Laser Measurements
- Botany Field Techniques: Field Sampling; Storage and Cataloging Botany Samples; Pollination and Seed Dispersion Analysis; Herbivory Analysis
- Ornithology Field Techniques: Bird Observation & Techniques in the Field; Research Field Techniques: Mist-netting, Point-counts, Transects, and Observation Points
- Entomology Field Techniques: Insect Observation Techniques in the Field; Research Field Techniques: Light-trap, Pit-fall Traps, Insect Nets, Berlèse Technique

- Comparative Investigation Project Development: Field conduction of CIP during the 4 main studied ecosystems. Special time will be allocated for the development of CIP during each excursion
- Statistical Analysis: Comparative Analysis (including multivariable analysis), Species Accumulation Curves & Rarefaction Analysis, Biodiversity Index

Instructors: Lou Jost (Biologist & Bio-Statistics Expert); Xavier Silva, Javier Robayo, Diana Serrano. Also local guides and community members depending on the situation

Reading:

Brower, James E. Jerrold Zar, and Carl Von Ende (1998). Field and Laboratory Methods for General Ecology. *4PthP ed., Boston : WCB McGraw-Hill*

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Module 2: Project Proposal & Development

This module aims to prepare students to propose, organize and develop science projects in the field, followed by the proper application of basic social field techniques and ethics towards local human groups.

Sessions:

- Project Proposal: The Logical Framework Approach for Field Project Development; Current techniques for project proposal & development; Application to the ISP Proposal
- Ethics Involving Working with Local People: Analysis of ethical elements involving research project development
- Professionalism in the Field and Ethical Interaction with Local Partners; Respectful Participation and Behavior in a Local Community; Reciprocity Towards Local Partners; Giving back the Data and Results to the Local Partners

Instructors: Leonore Cavallero, Xavier Silva, Javier Robayo, Diana Serrano.

Reading:

- A Short Guide to Writing about Biology. Third Edition. *Wesley Longman Inc., New York, 2001*

Student Evaluation and Grading Criteria

Assignments:

Comparative Investigation Project CIP: This is a team research project based on fieldwork during Cloud Forest and Amazon excursions. This assignment simulates a real life research experience with field studies, a science paper, and an oral presentation. Groups and topics are selected during Orientation Week. At each site you will have at least two hours for CIP. Between excursions, you need to dedicate extra time for statistical data analysis, documentation and finding secondary sources. The written work (about 10 pages single space) follows a science format, including introduction, methodology, materials, analysis, discussion, suggestions and a bibliography. Also includes data tables, science graphs, pictures and any related science aid. The oral presentation is usually provided with a Power Point.

Methods Work/Exams: This assignment is an analysis of data gathered during Paramo, Cloud Forest and Amazon excursions. The assignment is developed in groups of 4 or 5 students. Usually includes population/census studies of plants and/or animals; forestry studies, or any other type of work given the local conditions (availability of guides, weather, etc.). ADs will indicate the type of work to develop during the field excursion. The report is composed by a short data analysis and conclusions in 3 or 4 pages, depending on the study. The due date of this assignment will be indicated by ADs, but otherwise is due the same day of Field Notebook by midnight.

Participation: Evaluates student's participation during this course. Participation is based on:

- Preparation, attendance, and attitude in all lectures, discussions, activities, and excursions
- Active contribution in group meetings

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- Completion of written assignments
- Completion of assigned readings
- Culturally respectful behavior, flexibility, punctuality and enthusiasm

Assessment:

- Comparative Investigation Project (CIP): 70% (10% oral; 60% written)
- Work/Exam: Paramo 5 pts; Cloud Forest 10 pts; and Amazon 10 pts. Total 25%
- Participation: 5%

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

Readings Both required and optional readings will be distributed to students during Orientation Week. Readings are organized by ecosystems: Ecuador General; Galapagos/Coast; Cloud Forest/ Páramo; and Amazon. Optional readings are designed to complement and expand upon the information provided on required readings and on the information covered by lectures, offering different points of view as well as more in-depth discussion of the topics. We recommend students to keep up with the optional readings throughout the semester. Readings should be properly cited in your assignments.

Assignments Timely completion of all assignments is expected. Late hand-ins will be penalized. All assignments are evaluated according to organization, analytical quality, depth of understanding, argumentation, and presentation of evidence.

Please see the SIT Study Abroad Student 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 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.

Please Note: Course contents, lecturers, and readings may be modified as needed. Should any change of class topics or lecturers may be necessary, student will be promptly notified.

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