

Environmental Research Methods and Ethics

ENVI-3500 (4 credits)

Tanzania: Zanzibar - Coastal Ecology and Natural Resource Management

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 prepares students to learn and research effectively in a nontraditional, cross-cultural environment. It provides experience with field study techniques, both environmental and anthropological, and facilitates students' development of an in-depth and ethical Independent Study Project (ISP). Course content emphasizes understanding cultural difference and the human-environment context as fundamental to knowing ecosystems and society through fieldwork. The course teaches field methods and skills: marine and terrestrial field survey and observation, use of orienteering tools, digital documentation, and interviewing. Also engaged are record keeping, statistical analysis, interpretation, and presentation of primary data linked to environments and society. Through excursions and field assignments, the course introduces and critically employs scientific and social scientific methods appropriate to the program theme. The course further introduces the Institutional Review Board (IRB) process necessary for student research clearance and adequately prepares students to develop a feasible and ethical Independent Study Project.

Learning Outcomes

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

- Show informed awareness of society and of the practicalities of field research in Zanzibar, including sustainability and reciprocity;
- Understand core natural and social scientific concepts;
- Demonstrate key methods for field study, including the collection of primary data in ecology, society, and natural resource management;
- Demonstrate skills and the use of essential tools for orienteering, digital documentation (e.g. of reef health), and interviewing;
- Formulate a research question and develop a scientific research design;
- Apply appropriate statistics to analyze and represent data;
- Show familiarity with the IRB process and ethically-sound field research;

- Demonstrate a critical understanding of past student ISPs and local field studies; and,
- Develop an appropriate, feasible, sound, and focused proposal for an Independent Study Project (ISP)

Language of Instruction

This course is taught in English. Students will be exposed to vocabulary related to course content as well as the nuances of coastal environments, Swahili society and culture, and research practices and tools through in-country expert lectures, field visits, and activities at a 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 other scholars, such as Dewey, Piaget, and Lewin. 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 part cycle of *a concrete experience, reflective observation, abstract conceptualization, and active experimentation* embedded in the experiential learning model is not always linear. The stages of taking part in a shared experience, reflecting on the experience by describing and interpreting it, challenging 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 so that they are empowered to be lifelong learners.

Required Texts

There are no required text books but there are required readings. See the Course Schedule (below). Referenced books and articles are available from the in-country program library and/or through SIT's electronic library database.

Assignments and Evaluation

This course employs discussions, field activities, readings, and assignments to help students learn about environmental research methods and ethics. The instructor evaluates student assignments and participation based on timeliness, completeness, seriousness of purpose, and, when relevant, the demonstration of cooperative teamwork among group members. The evaluation of assignments further accounts for their clarity of organization, accurate background, supportive data, appropriate analysis, coherence and depth of argument, and the quality of written, visual, and/or oral presentations.

Assignment Descriptions and Grading

Brief summaries of all graded course activities appear below. Elaborated descriptions of all graded course activities and rubrics appear in the Program Academic Handbook which is distributed to students on arrival in Zanzibar.

1) Participation in Discussions and Readings (10%)

- 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, entertaining contradictory perspectives, and taking notes.
- Involvement in Class Discussions - either in small or large groups, sharing knowledge. This means challenging yourself to speak up if you usually do not, 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.

2) Four Quizzes (20%)

Each student takes four 12-minute quizzes (5% each) during the semester. Each quiz addresses specific activities and readings about environmental research methods and ethics. Each quiz is eight questions, half multiple choice and half short answer.

3) Mangapwani Paper (15%)

During a 3-day visit to Mangapwani, groups of two to three students collect social science interview data about aspects of community livelihoods and health that interface with environmental factors. Students learn how to effectively conduct interviews and utilize translators. Based on the collected data, each student group composes a 5-page paper that addresses community livelihoods, health, or gender.

4) Mangapwani Presentation (10%)

Based on a 3-day visit to Mangapwani and the data collected, each student group delivers a 20-minute visual and oral presentation (using PowerPoint) about aspects of community livelihoods and health that interface with environmental factors. The presentation is followed by a 10-minute question/answer session from the student group, Academic Director, program staff, and program partners from Mangapwani.

5) Independent Study Project Proposal (30%)

Each student composes an 8-page ISP proposal. The proposal outlines a field investigation in the Zanzibar Archipelago that collects original data to respond to a thesis/hypothesis about a topic in coastal ecology and natural resource management. In addition, each student prepares an annotated bibliography with at least 12 peer-reviewed via APA format. The ISP proposal must be approved by the Academic Director and a Local Review Board before the ISP period begins. [If the study has been funded by a U.S. government agency, or if the student plans to take the research back to their 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. Each student should make inquiries and develop their ISP topic through discussions with the Academic Director, program staff, program partners, and in-country institutions and experts. Although there is 1-week set aside for ISP proposal preparation, it is advised that students begin developing their ISP ideas and projects on arrival in Zanzibar. To design a successful ISP, the following factors should be taken into account: timeframe (4 weeks), resources, site(s)/location(s), logistics, safety, ethics, pre-existing literature, thesis/hypothesis, method(s), equipment, original data of appropriate sample size, analytics, and the significance of potential ISP outcomes for science and/or the community in Zanzibar.

6) ISP Presentation (15%)

Each student delivers a 20-minute visual and oral presentation (using PowerPoint) that outlines their ISP proposal. Presentations should include an introduction, thesis/hypothesis, statement of significance, literature review of key concepts and topic, background about the site(s) of research (including maps), an outline of proposed field method(s) to collect original data, and a review of the intended data analysis. The presentation is followed by a 10-minute question/answer session from the student group, Academic Director, program staff, Local Review Board, and program partners.

Assessment

- Participation in Discussions and Readings – 10%
- (4) Quizzes – 20% (5% each)
- Mangapwani Paper – 15%
- Mangapwani Presentation – 10%
- Independent Study Project Proposal – 30%
- ISP Presentation – 15%

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 (e.g., those of classmates, lecturers, and local constituents engaged with 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.
- 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 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: Personal computers (but not cell phones) 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 unapproved devices for something other than classroom tasks.
- 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.

Course Schedule

This course takes the form of topical modules that incorporate student activities and assignments.

**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 I: Context, Cultural Adjustment, and Experiential Learning

This module introduces students to field research in a study abroad context in eastern Africa and the western Indian Ocean. Students consider representations of African environments and communities and the ways in which standpoints shape approaches to Africans, ecosystems, and research. Furthermore, the module introduces students to strategies for effective living in Zanzibar and mainland Tanzania, including norms of hygiene, dress, gender, age, and power. Students learn to appreciate their positionality within SIT's experiential pedagogy.

- Adams, J., & McShane, T. (1997). *The Myth of Wild Africa: Conservation without Illusion*. University of California Press.
- Tharoor, I. (2009, September 18). How Somalia's Fishermen became Pirates. *Time*, 156.
- Walley, C. (2010). *Rough Waters: Nature and Development in an East African Marine Park*. Princeton University Press.

Module II: Coastal Marine Environmental Research Methods

This module introduces students to essential marine environmental research concepts and methods off of Unguja Island. Two excursions in Unguja facilitate the collection of primary marine data in marine niches. Activities and discussions emphasize logistics, field equipment, field inventories of biodiversity, census techniques of animals, and evidence of recent climate change and other environmental impacts. Digital tools, such

as GoPros, will be used to gather field data, especially as it relates to evidence of environmental impacts. Teams of students collect, analyze, and represent primary field data on invertebrates and fish.

- English, S., Wilkinson, C., & Baker, V. (1997). *Survey Manual for Tropical Marine Resources*. Australian Institute of Marine Science.
- Milroy, S. (2015). *Field Methods in Marine Science: From Measurements to Models*. Garland Science.
- Richmond, M. (2002). *A Field Guide to the Seashores of Eastern Africa and the Western Indian Ocean Islands*. SAREC.

Module III: Coastal Terrestrial Environmental Research Methods

This module introduces students to essential terrestrial coastal environmental research concepts and methods in Unguja. Excursions to Jozani-Chwaka Bay National Park facilitate the collection of primary data of animals and plants in mangrove forests and terrestrial hardwood forests. Activities and discussions emphasize logistics, field equipment, orienteering, field inventories of biodiversity, census techniques of plants and animals, behavioral studies, and evidence of climate change and recent environmental impacts. Teams of students collect, analyze, and represent primary field data on forests, frogs, and land snails.

- Ellison, J. (2015). Vulnerability Assessment of Mangroves to Climate Change and Sea-Level Rise Impacts. *Wetlands Ecology and Management*, 23.
- Ford, E. (2000). *Scientific Methods for Ecological Research*. Cambridge University Press.
- Vonesh, J., Mitchell, J., Howell, K., & Crawford, A. (2010). Rapid Assessments of Amphibian Diversity. In Dodd, C. (Ed.), *Amphibian Ecology and Conservation: A Handbook of Techniques*. Oxford University Press.

Module IV: Conventional Social Science Research Methods and Ethics

This module introduces students to social science research methods in Unguja. An excursion to Mangapwani facilitates the collection of primary data on a coastal fishing community. The core methods studied include participant-observation and structured and unstructured interviewing. The Creative Solutions program - an NGO - at Mangapwani engages people and logistics, field equipment, field notes, translators, project scheduling, and the collection of demographic, cultural, and behavioral data. Teams of students collect, analyze, and represent primary field data on individuals, families, and the wider Mangapwani community. The group considers the positionality and privilege of foreign researchers and the interests of diverse stakeholders in social science research. Also addressed are the ethics surrounding researcher and community identities, dress, language use, and reciprocity.

- Bernard, H. (2012). *Social Research Methods: Qualitative and Quantitative Approaches*. Sage.
- Boswell, R. (2017). Sensuous Stories in the Indian Ocean Islands. *The Senses and Society*, 12.

- Jasanoff, S. (1996). Is Science Socially Constructed, and Can It Still Inform Public Policy? *Science and Engineering Ethics*, 2.
- Peshkin, A. (1988). In Search of Subjectivity - One's Own. *Educational Researcher*, 17.
- Reyes-García, V., Fernandez-Llamazares, A., Gueze, M., Garces, A., Mallo, M., Vila-Gomez, M., Vilaseca, M. (2016). Local Indicators of Climate Change: The Potential Contribution of Local Knowledge to Climate Research. *WIREs Climate Change*, 7.
- Shilabukha, K. (2018). Navigating the Sea Space: The Nature and Significance of Giriama Indigenous Knowledge on Marine Resources. *Western Indian Ocean Journal of Marine Science*, 17.

Module V: Human-Environment Interfaces: Ethics in Human Resources Use, Health, and Development

This module is the first of two modules that introduces students to the relationship between humans and regional environments. At the University of Dar es Salaam (on mainland Tanzania) and on Pemba Island, excursions engage rural and urban environmental challenges and solutions in Tanzania. Cases include, but are not limited to climate change evidence and mitigation, wildlife management, food-crop and cash-crop farming, salt mining, urban sprawl, solid waste disposal, fresh water use, alternative energy strategies, and human and environmental health. This module also addresses how the human-environment interface can be better addressed by posing scientific questions, formulating appropriate research designs, and practicing more sustainably in eastern Africa and the western Indian Ocean.

- Guedes, J., Crabtree, S., Bocinsky, R., & Kohler, T. (2016). Twenty-first Century Approaches to Ancient Problems: Climate and Society. *Proceedings of the National Academy of Sciences*, 113.
- Holland, J., & Campbell, J. (2005). *Methods in Development Research: Combining Qualitative and Quantitative Approaches*. ITDG.
- Myers, G. (2016). *Urban Environments in Africa: A Critical Analysis of Environmental Politics*. Policy Press.

Module VI: Human-Environment Interfaces: Ethics in Ecotourism, Natural Resource Management, and Conservation

This module is the second of two modules that introduces students to the relationship between humans and regional environments. On Mafia, Chumbe, and Misali islands, and in Mikumi Park in interior Central Tanzania, excursions to unique localities touch on the successes and challenges of national parks as well as private ecotourism ventures. This module considers such arrangements from multiple standpoints, including those of different African communities. The group further discusses, in a critical manner, relevant laws, governance of conservation entities (public and private), roles of local and foreign scientists, and the inner workings and politics of parks development in the region.

- Holt, F. (2005). The Catch-22 of Conservation: Indigenous Peoples, Biologists, and Cultural Change. *Human Ecology*, 33.

- Nelson, F., Nshala, R., & Rodgers, W. (2007). The Evolution and Reform of Tanzanian Wildlife Management. *Conservation and Society*, 5.
- Nordlund, L., Kloiber, U., Carter, E., Riedmiller, S. (2013). Chumbe Island Coral Park - Governance Analysis. *Marine Policy*, 41.
- Samways, M., Hitchins, P., Bourquin, O., & Henwood, J. (2010). Restoration of a Tropical Island: Cousine Island, Seychelles. *Biodiversity Conservation*, 19.
- Walley, C. (2010). *Rough Waters: Nature and Development in an East African Marine Park*. Princeton University Press.

Module VII: Successful and Ethical ISP Proposal

This module further enables students in the selection of an ISP topic, a key question, and appropriate field methods. It stresses the design, writing, and presentation of a successful ISP proposal. Moreover, it prepares students for challenges in the field and ensures the environmental and social ethics of project proposals.