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THE SCHOOL
FOR FIELD STUDIES

Directed Research

SFS 4910

Syllabus
4 credits

The School for Field Studies (SFS)
Center for Tropical Island Biodiversity Studies (TIBS)
Bocas del Toro, Republic of Panamá

This syllabus may develop or change over time based on local conditions, learning opportunities, and faculty expertise. Course content may vary from semester to semester.

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COURSE CONTENT SUBJECT TO CHANGE

Please note that this is a copy of a recent syllabus. A final syllabus will be provided to students on the first day of academic programming.

SFS programs are different from other travel or study abroad programs. Each iteration of a program is unique and often cannot be implemented exactly as planned for a variety of reasons. There are factors which, although monitored closely, are beyond our control. For example:

- Changes in access to or expiration or change in terms of permits to the highly regulated and sensitive environments in which we work;
- Changes in social/political conditions or tenuous weather situations/natural disasters may require changes to sites or plans, often with little notice;
- Some aspects of programs depend on the current faculty team as well as the goodwill and generosity of individuals, communities, and institutions which lend support.

Please be advised that these or other variables may require changes before or during the program. Part of the SFS experience is adapting to changing conditions and overcoming the obstacles that they may present. In other words, this is a field program, and the field can change.

Center Research Direction

The global research question that we want to address during this research course is:

How can the natural resources of the BDT archipelago best be managed in order to promote conservation and sustainable use considering the socio-economic environment?

Course Overview

The aim of this course is to provide students with the opportunity to apply ecological, biological, and/or social-scientific methods to a field research project that addresses a local issue related to the environment. We will investigate the ways that various methods and theories distinguish (or do not) fact from interpretation, cause from correlation, and advocacy from objectivity. The Directed Research topics are driven by the needs and interests of Bocas del Toro. Through the directed research projects, students will contribute to a growing body of scientific research that informs local conservation and resource management decisions.

Each student will join a faculty-led team that will carry out field research, data analysis, and communication of results in one or across several of the following disciplines: ecology, natural resource management and social sciences. All Directed Research projects are collaborative. The course is designed to build on the information students have learned in the Tropical Coastal Ecology, Principals of Resource Management, and Environmental and Socio-economic Values courses as well as Culture and Language, Directed Research lectures and workshops specifically designed to assist students in understanding the scientific process, testing hypotheses, and presenting results in both written and spoken formats.

Learning Objectives

The core skills students will learn in this course are field techniques, analytical methods, skills, and critical thinking, as well as teamwork, and time management. The specific objectives of the course are:

1. Understand the process of **designing** a field research project
2. **Conduct** field sampling
3. Manage, interpret, and analyze **data** sets
4. **Communicate** research results to diverse audiences
5. Manage teamwork within the context of **collaborative** research

Assessment

You will present your DR projects in the standard scientific formats of a peer-review style report and a conference style presentation. You will also be graded on your data management and your positive contribution to the class. Comprehensive details of all assignments will be provided separately.

| Assessment Item | Value (%) |
|--|------------|
| Project Proposal | 25 |
| Peer Review | 15 |
| Final Paper | 25 |
| Presentation and Panel Defense | 20 |
| Group Poster and Video | 10 |
| Directed Research Skills – Data Management and Participation | 5 |
| TOTAL | 100 |

Project Proposal (25%)

The project proposal has two elements: a **Literature Review** and a **Project Summary**.

1. Literature Review

The main objective of the Literature Review is for students to familiarize themselves with previous research and publications in their chosen Directed Research project. This should draw upon a literature base (where possible) to initially review the status of research in the field and then to build a setting and justification for research that still remains to be done.

The Literature Review should include:

- A full literature review: A critical evaluation of knowledge in the subject area
- An exploration of the DR project status within the literature: Highlight knowledge gaps and how the proposed project fits within the current literature

2. Project Summary

The main objective of the Project Summary is for students to develop a detailed outline for their Directed Research. The Project Summary should include:

- Aims/Hypothesis(es): A list of questions that the student would like to answer as a result of the research project they will design
- Materials & Methods: A detailed description of the methods to be used in their study and why these methods will be used over other potential methods. This should include sampling design, as well as the physical data collection methods to be employed
- Predicted Findings & Importance: A list of predicted findings and implications for each

Peer Review (15%)

Each group member will be evaluated by each of their peers and receive the average grade of this evaluation. The grade rubric will assess effort, professionalism, ability to work in a team atmosphere, academic contribution to the project, and quality of the contribution. Each team member will review themselves and in addition provide assessment of their peers. Please note that these reviews are anonymous, and we expect honest and thorough evaluation of work. If the same grade is assigned to each of your peers, your Directed Research professor will ask you to re-evaluate the grades assigned.

Final DR Report (25%)

The final report will be written in the style of a peer-review submission to a journal in the appropriate field. You will have ample guidance from your DR supervisor throughout the DR period, and especially during DR data collection, analysis and report write-up. The analytical tools for research workshops in the DR course (and complementary classes in other courses) are designed to prepare you for producing the results section and improve the quality of your work.

Presentation and Panel Defense (20%)

You will present a subset of your DR work in a conference style presentation of 12 min length with additional time for questions. Unless the scope of your DR project is very small, you should not attempt to squeeze in everything from your final report into this presentation. Making sure that you are within the time limit is a very important skill and so thorough rehearsal is important.

Group Poster and Video (10%)

Students will be grouped based on their research project topics and will create and present a scientific poster and short video to the community. Groups will create a video presentation, preferably in Spanish with English subtitles or in English with Spanish subtitles using footage that you have recorded during directed research to present to the community. The videos should outline the goal of the research project, its importance to Bocas and to greater society, methods, results, conclusions and future plans. Videos should be between 3-5 minutes.

Directed Research Skills - Data Management and Participation (5%)

It is important to record and store research data in a manner that is useful. You will need to provide an Excel sheet (or sheets) with your research data in a format that is intelligible to someone else. You need to provide both raw and manipulated data you used to create figures, tables and to run statistical tests. You need to annotate your spreadsheets so that an outsider can understand the data.

Your Directed Research Skills will be graded throughout the DR course by your supervisor. Your final grade will depend upon your attendance to all DR activities, active involvement and competencies in field data collection, data entry and group participation/support.

Grading Scheme

Grade corrections in any of the above items should be requested in writing at least 24 hours after assignments are returned. No corrections will be considered afterwards.

| | | | | | | | |
|----|-----------------|----|----------------|----|----------------|---|----------------|
| A | 95.00 - 100.00% | B+ | 86.00 - 89.99% | C+ | 76.00 - 79.99% | D | 60.00 - 69.99% |
| A- | 90.00 - 94.99% | B | 83.00 - 85.99% | C | 73.00 - 75.99% | F | 0.00 - 59.99% |
| | | B- | 80.00 - 82.99% | C- | 70.00 - 72.99% | | |

General Reminders

Intellectual Property – There are many implications about intellectual property and the use of data and research frameworks beyond your semester experience. Many DR projects form part of ongoing and developing research lines at SFS Centers, the work of which is the intellectual property of SFS faculty. However, faculty are always interested in continuing collaborations, and there is often the possibility for student *co-authorship* on future academic publications. We will discuss the ethics of data gathering and academic publications during the semester, but you can also review in advance SFS's [data policy](#).

Plagiarism – Using the ideas and material of others without giving due credit, is cheating and will not be tolerated. A grade of zero will be assigned if anyone is caught cheating or aiding another person to cheat actively or passively (e.g., allowing someone to look at your exam). All assignments unless specifically stated should be individual pieces of work.

Deadlines – Deadlines for written and oral assignments are instated for several reasons: they are a part of working life to which students need to become accustomed and promote equity among students. Deadlines allow faculty ample time to review and return assignments before others are due. Late assignments will incur a 10% penalty for each day that they are late. No assignment will be accepted after three days. Assignments will be handed back to students after a one-week grading period.

Participation – Since we offer a program that is likely more intensive than you might be used to at your home institution, missing even one lecture can have a proportionally greater effect on your final grade simply because there is little room to make up for lost time. Participation in all components of the program is mandatory because your actions can significantly affect the experience you and your classmates have while at SFS. Therefore, it is important that you are prompt for all DR activities, bring the necessary equipment for field research, and simply get involved.

Course Content

L: Lecture, FEX: Field Exercise, W: Workshop or structured discussion

| DR Coursework Component: The coursework component of the DR is designed to prepare the students to conduct scientific research. The lectures are delivered throughout the semester, in conjunction with the topical courses, so that students are well prepared to work with their faculty mentor on meaningful research. Some of the course activities below will be delivered to the whole class, or as part of your specific DR group once you have selected a given project. | | | |
|---|--|--------------|-----------------------|
| No | Title and outline | Type | Hours |
| DR 01 | Course introduction Review of the DR syllabus and discussion of the course objectives | L | 0.5 |
| DR 02 | Analytical Tools for Research This lecture gives an overview of some of the most common statistical methods and tools to analyze scientific data | L | 2.0 |
| DR 03 | Effective Communication Skills I: Figures and Tables Why do we use figures and tables? How should they look? What should be included? | L | 1.0 |
| DR 04 | Project Descriptions Faculty introduce DR projects | L | 1.0 |
| DR 05 | DR Meetings Students meet in their respective DR groups with faculty advisors | W | 1.0 |
| DR 06 | Scout Field Sites | FEX | 3.0 |
| DR 07 | Project Proposal - Group Meeting Students meet with DR professors to discuss proposal writing. | L | 1.0 |
| DR 08 | Effective Communication Skills II: Presenting Data, Scientific Communication | L | 1.0 |
| DR 09 | How to Write and Present a Scientific Poster | L | 1.0 |
| DR 10 | Ethics in Research and Human Subjects Research Introduce students to the ethical considerations involved in science | L | 1.0 |
| DR 11 | DR Prep Day I Students work with DR faculty members in the classroom, laboratory, and field to determine logistics, plan research collection days, and practice field methods | FEX | 6.0 |
| DR 12 | DR Prep Day II Students work with DR faculty members in the classroom, laboratory, and field to determine logistics, plan research collection days, and practice field methods | FEX | 8.0 |
| | | Total | 26.5 Hours |
| DR Research Component This portion of the DR course is made up of research time, which includes data collection, synthesis, and dissemination. Given the intense nature of the Directed Research project, students receive over 140 contact hours during this period. | | | Days Allocated |
| Data Collection Students work within their DR group to go into the field to collect data | | | 10 days |
| Data Synthesis Students work closely with their faculty mentors to analyze their collected data and write up their findings in a structured scientific paper | | | 5 days |
| Research Dissemination Students prepare, practice, and deliver presentations for SFS and community audiences. | | | 2 days |
| Total | | | 17 days |