



THE SCHOOL  
FOR FIELD STUDIES

# Directed Research SFS 4910

## Syllabus

The School for Field Studies (SFS)  
Center for Sustainable Development Studies (CSDS)  
Atenas, Costa Rica

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.



## **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 may be present. In other words, the elephants are not always where we want them to be, so be flexible!

## Center Research Direction

The directed research direction is defined by the Center for Sustainable Development Studies Five-Year Research Plan (5YRP), which originates from the collaborative process between the center staff and local stakeholders. Through Directed Research students will contribute to a growing body of scientific research that informs local conservation and resource management decisions on the development of social, cultural and ecologically sound alternatives of natural resource use and biodiversity protection integrated by the 5YRP question:

*How can Costa Rica respond to local and global challenges while securing the functionality of its natural and human systems?*

Answers to the above question will improve the understanding of the impact of globalization, climate change, real estate expansion into rural areas, increased tourism visitation, and conflicts between parks and people regarding land-use change within the cultural context of Costa Rica.

## Course Overview

---

The aim of this course is to provide students with the opportunity to apply the scientific process in a field research project addressing a local issue related to the environment. This course prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity.

The course will give you an intensive practical field experience conducting research in tropical areas on a topic of immediate relevance to specific clients working in the context of sustainable development (protected areas, government offices, local communities).

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. The course is designed to build on the information students have learned in the core courses as well as 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 (see below for the description of activities). Therefore, students will go through the steps of the research process: identification of relevant questions within the economic, ecological and cultural context of a region and client needs; experimental design; field data collection; methods of statistical data analyses; and presentation of results to the interested parties and the scientific community. Issues to be examined include (but are not limited to): a. the quantification of ecosystem services within and around protected areas, b. human impacts on wildlife ecology within and around protected areas (i.e., increased road traffic, extraction of non-timber forest products, environmental impacts in high volume tourism areas). In their research projects, students will integrate concepts and methodologies learned in class, field lectures, and field exercises and help to deliver technical information to our stakeholders.

## Learning Objectives

---

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

1. Understand the process of designing a field research project
2. Conduct field data collection
3. Manage, interpret and analyze data sets
4. Communicate research results to diverse audiences
5. Being able to manage team work within the context of collaborative research

## Assessment

---

We expect active participation in all aspects of DR, from the discussion and analysis of assigned readings and associated literature, the review of new literature, classes, and field components (data collection, data compilation, and data analyses). The DR experience is a group effort and there is the option of developing different products of this process (i.e., poster and paper) in a collaborative manner. All members of the DR group work together to collect data in the field. Working individually or in groups, students will identify and address a distinct question within the overall project and will be responsible for data analysis, interpretation and communication of their own results. Each topic will address the overall objectives of the research problem at hand, and may use the current data, previous research if available, or a combination of the two. The aim is to give you enough room to develop your own individual or group creativity within the context of the Directed Research project at hand. All topics must be related to the general questions and objectives, which are part of proposed research problem and the overall Center's 5YRP.

Performance in the Directed Research course will be evaluated based on the assessment items and their proportional weight to your final grade described below. Each assessment item will be evaluated on an individual or group basis depending on the chosen modality (individual or collaborative DRs).

Assessment Item	Grade Value (%)
DR Field research skills	10
Statistics homework	5
Literature Review	10
First DR Paper	30
Final DR Paper	10
Oral Presentation	10
Data Management	5
Poster	5
Participation	15
TOTAL	100

**DR field skills.** Your Directed Research field skills will be graded throughout the DR course by your supervisor taking into account your attendance to all DR activities, active involvement and competencies in field data collection, quality of data collection, data interpretation and analyses, and group

participation/support. Students will produce a short report, map or other final project, as determined by each professor, based on the research done prior to DR.

**Statistics homework.** Your DR advisor will assign an exercise on statistics using data collected during the DR field research skills (which could include a short report depending on your DR group), data from previous experiments, etc. The details of the statistics homework will be explained by your DR advisor.

**Literature review.** Your DR advisor will indicate the number and type of scientific sources you will be exploring to support your research topic for your DR paper. It is expected that you will find, read, interpret and provide criticism of the scientific literature.

**First DR paper.** The first draft is written in the style of a peer-review submission to a journal in the appropriate field. You will have ample opportunity for guidance from your DR supervisors throughout the DR period and especially during DR data analysis week. It is expected that you will integrate exercises from the core classes, and the previous DR classes (scientific method, statistical analyses, etc.) into the generation of a sound first draft considering that it has an important weight on the final grade of this course. Adjusting to the format described in “Directions for writing scientific reports” is critical.

**Final DR paper.** The final paper should integrate all the corrections and edits requested by your DR advisor. Consistent with the first draft, the final paper should adjust to all format and content following the “Directions for writing scientific reports”.

**Oral Presentation.** You will present your DR work in a conference style presentation of 10-15 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 therefore thorough rehearsal is important. Your grade will be based on the clarity, presentation structure, quality and clarity of graphics, and overall information delivery.

**Data Management.** It is important to record and store research data in a manner that is useful. You will need to provide (as applicable) Excel sheets with your research data in a format that is intelligible to someone else. You may 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 (use text boxes if appropriate) so that an outsider can understand what the data are. You may be required to provide field notes on your findings for review.

**Poster.** The ability to summarize your research in a poster format is a very important skill. Your grade will be based on the clarity of the information, the structure of the poster, as well as on its aesthetic value.

**Peer Review:** Each group member will be evaluated by each of their peers within the collaborative DR group option, and will receive the average grade of this evaluation. The grade rubric will assess: effort, professionalism, and 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 on their peers. For assessment, a rubric outlining grading components and the weighting for each is provided in the last page of this document.

**Participation.** Science is a social activity. Developing the necessary skills to work as part of a team is a critical aspect of scientific research, both in the field and back at the Center in terms of collaborating in data collection, data analyses, and data presentation.

Grade corrections for any of the above items should be requested in writing at least 24 hours after assignments are returned. No corrections will be considered afterwards. The grading scheme is the following:

### Grading Scheme

---

A	95.00 - 100%	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	59.99-0.00%
		B-	80.00 - 82.99%	C-	70.00 - 72.99%		

### General Reminders

---

**Plagiarism:** using the ideas or material of others without giving due credit – is cheating and will not be tolerated. A grade of zero will be assigned for anyone caught cheating or aiding another person to cheat either actively or passively.

**Readings.** Professors may provide readings to students during the course. Students are also expected to collect their own research material for use in the literature review and to improve their knowledge on individually selected research areas. Most of the readings are in PDF format.

**Deadlines** for assignments are established to promote equity among students, to allow faculty enough time to review and return comments and grades before other assignments are due; and to avoid clashes with other activities and courses. Therefore, deadlines are firm and extensions will only be considered under extreme circumstances. When appropriate, the files should be placed in the assigned folder within the students drive on the server.

Late assignments will incur a 10% penalty for each day that they are late. Papers submitted after 3 days of the dateline will not be accepted. Please plan ahead to avoid such situations.

It is the responsibility of the faculty to articulate how grades are determined. It is the responsibility of students to consider these explanations and, if there is a lack of clarity, to request clarification immediately. Students who feel that any grading basis or grades are unfair should explain their concerns directly to the relevant faculty in writing using the “Grade Change Petition Form”. Their written explanation on the “Grade Change Petition Form” must include both their reasons for believing the unfairness exists and their requests for specific changes. Faculty members have the obligation to respond fully, clearly, and promptly.

Cheating and plagiarism in any form or manifestation will not be tolerated and will carry very severe consequences that range from a grade of 0 in the material to a request by the professor to the CD of expulsion from the program.

## Course Content

**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.

No.	Lecture Title and Description	Type	Time (hours)
DR01	<b>Directed Research Introduction (intro to SFS 101).</b> The 5-year research direction, as well as the impact of research of CSDS at the local and national level, is discussed. The presentation explains how research combines with the rest of the academic and social outreach activities of CSDS in Costa Rica.	L	0.5
DR02	<b>Risk and Time Management in Field Research.</b> The most common sources of risks while doing field research within the context of Costa Rica will be discussed and analyzed during this lecture. Special emphasis is given to sound planning and time management in the design of scientific research.	L	1
DR03	<b>Introduction to Scientific Methods.</b> Students will learn different methods to carry out scientific research by identifying relevant questions and designing testable hypotheses. Alternative methods of scientific inquiry are discussed (i.e., deductive, inductive, hypothetical-deductive, etc.)	L	1
DR04	<b>How to write scientific reports.</b> Students will learn the basic format of the research paper implemented at CSDS. In addition, the structure of the presentation of scientific information is discussed and explained to the students.	L	1
DR05	<b>DR agenda presentation and group division.</b> Professors will present the DR projects planned for the semester, going over logistics, methods, and major goals. Students will select their DR project.	L	1
DR06	<b>Stats 1: Introduction to statistical distributions and hypothesis testing.</b> Students will learn the concept of statistical distributions, parameter determination, and hypothesis testing along with practical examples.	L/Lab	2
DR07	<b>Ethical Research Practices.</b> Faculty and students will discuss problems associated to ethical issues in research, such as data manipulation, pattern recognition, plagiarism, animal rights, and related questions.	L	1
DR08	<b>Stat training:</b> Statistical classes (t-test, ANOVA, regression, correlation, contingency table analyses, multivariate techniques) will be delivered and adapted by each professor depending on the characteristics of the research project	L/D	5
DR09	<b>Effective Communication Skills: oral presentations and posters.</b> In this lecture, students will learn appropriate ways of presenting scientific information in a power point presentation as well as posters specific to their DR.	L	1
DR09	<b>Stat training:</b> Statistical classes (t-test, ANOVA, regression, correlation, contingency table analyses, multivariate techniques) will be delivered and adapted by each professor depending on the characteristics of the research project	L	5

No.	Lecture Title and Description	Type	Time (hours)
DR10	<b>Literature Review Instructions.</b> Students will learn the use of different databases and repositories available in the internet. In addition, they will get acquainted with resources available at the Center, such as previous reports and gray literature, in addition to peer-review papers.	L	1
	<b>Total</b>		<b>14.5</b>

**DR Research Component:** The rest of the DR course consists of research time, which includes: data collection; synthesis; and dissemination.

Research Component Activity	Days Allocated
<b>Data Collection</b> Students work within their DR group to go into the field to collect data	10 days
<b>Data Synthesis</b> Students work closely with their faculty mentors to analyze their collected data and write up their findings in a structured scientific paper	5 days
<b>Research Dissemination</b> Students prepare, practice, and then deliver presentations for both internal SFS and community audiences.	3 days
<b>Total</b>	<b>18 days</b>