Directed Research
SFS 4910

Syllabus
4 credits

The School for Field Studies (SFS) & Blue World Institute (BWI)
Center for the Conservation of Marine Megafauna
Veli Lošinj, Lošinj Island, Croatia

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.

Center Research Direction

The Center for the Conservation of Marine Megafauna is a partnership between the SFS and the Blue World Institute of Marine Research and Conservation (BWI), a non-governmental organization working in the Adriatic Sea since 2000.

Research is primarily boat-based and focuses on cetaceans and sea turtles both of which are important indicator species for the health of marine environments and the impacts of climate change. The Center works with these animals from population level to individual level which includes undertaking cetacean and sea turtle rescue procedures, sea turtle rehabilitation and husbandry practices, and veterinary investigations and diagnostics.

Research focuses on cetacean and sea turtle ecology and advising on the development of conservation measures for these species and their habitats. Faculty work with government partners, community members, NGOs, and other key stakeholders. Our faculty and students seek to analyze and develop strategies to understand the status of target species, identify threats, and support marine and coastal conservation initiatives in the Adriatic Sea. As part of this, the research undertaken by BWI has informed the development of Natura 2000 areas (part of the EU nature conservation network) throughout Croatian national waters (>12% of the territorial sea). In addition, the research has informed systematic conservation planning as part of wider marine spatial planning in the Adriatic Sea. This has utilized data from boat-based surveys, aerial surveys, and satellite tracking.

Course Overview

The aim of this Directed Research (DR) course is to provide students with the opportunity to apply ecological, biological, and/or social scientific methods to a field research project that addresses an issue related to the local or regional marine or island environment. This course prepares students to distinguish hidden assumptions in scientific approaches. It also highlights how various methods and theories differentiate (or do not) fact from interpretation, cause from correlation, and advocacy from objectivity. Through DR projects, students will contribute to a body of scientific research that informs local conservation and resource management decisions and furthers the Center's research agenda.

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 DR course is designed to build on the information students have learned in the topical courses as well as DR 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 these lectures and workshops).

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, see below for the general descriptions and expectations.

Assessment Item	Value (%)
Project Proposal	20
Final Report	35
Presentation	25
Data Management	10
Directed Research Skills	10
TOTAL	**100**

Project Proposal (20%)

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. A full literature review: A critical evaluation of knowledge in the subject area
   b. 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:
   a. Aims/Hypothesis(es): A list of questions that the student would like to answer as a result of the research project they will design
   b. 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
   c. Predicted Findings & Importance: A list of predicted findings and implications for each

Final Report (35%)

The final report 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. 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 (25%)

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.

Data Management (10%)

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.

Directed Research Skills (10%)

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 interpretation and group participation/support.

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	<60.00%
		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.

Honor Code/Plagiarism – SFS places high expectations on their students and we hold students accountable for their behaviors. SFS students are held to the honor code below. SFS has a zero-tolerance policy towards student cheating, plagiarism, data falsification, and any other form of dishonest academic and/or research practice or behavior. Using the ideas or material of others without giving due credit is cheating and will not be tolerated. Any SFS student found to have engaged in or facilitated academic and/or research dishonesty will receive no credit (0%) for that activity.

> *"SFS does not tolerate cheating or plagiarism in any form. While participating in an SFS program, students are expected to refrain from cheating, plagiarism and any other behavior which would result in a student receiving credit for work which they did not accomplish on their own. Students are expected to report any instance of cheating or plagiarism by others."*

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. Grade

corrections for any assessment item should be requested in writing at least 24 hours after assignments are returned. No corrections will be considered afterwards.

Content Statement – Every student comes to SFS with unique life experiences, which contribute to the way various information is processed. Some of the content in this course may be intellectually or emotionally challenging but has been intentionally selected to achieve certain learning goals and/or showcase the complexity of many modern issues. If you anticipate a challenge engaging with a certain topic or find that you are struggling with certain discussions, we encourage you to talk about it with faculty, friends, family, the HWM, or access available mental health resources.

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: Classroom lecture, L/Demo: **Classroom lecture and demonstration**

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	**DR Course Introduction** In this class, each Faculty will do a 30-minute overview of their DR to enable students do an informed decision in selecting their DR choice	L	1.0
DR 03	**Introduction to the Scientific Method** Familiarize students with the process of science and associated methods	L	1.0
DR 04	**Introduction to Scientific Writing & Reading** Explore the difference between primary and secondary sources; expectations and standards of practice; describe expectations for the DR paper	L	1.0
DR 05	**Qualitative & Quantitative Research Methods** Lecture will introduce students to qualitative and quantitative research	L/Demo	2.0
DR 06	**Research Ethics** The lecture will introduce students to the ethical considerations involved in research (e.g. human subject's protection, data integrity and management)	L	1.0
DR 07	**Risk & Time Management in DR** Will prepare students on how to manage risks in the field during data collection, and how to effectively manage the time allocated for the DR course	L	1.0
DR 08	**Effective Scientific Communication Skills** Students will understand the importance of scientific communication skills and start to think about how to address different audiences	L	1.0
DR 09	**Analytical Tools and Statistics**	L/Demo	3.0

	Students will learn the various methods that they will use to analyze and represent data from the field which suits their respective DR projects.		
DR 11	**Project Development & Proposal** Faculty will lay out expectations of student proposals and students and faculty will form discussion groups to further DR proposals.	L/Demo	4.0
	Total	**15 Hours**	

DR Research Component	Days Allocated
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	12 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.	3 days
Total	**20 days**