

BOTTLENOSE DOLPHIN RESEARCH INSTITUTE - BDRI

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FIELD RESEARCH COURSES (FRC) IN MARINE MAMMALS SCIENCE

FRC 1001 MONITORING COASTAL BOTTLENOSE DOLPHIN POPULATIONS

SYLLABUS
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1. COURSE OVERVIEW

FRC 1001 provides an in-depth, hands-on immersion into the field of marine mammal science and more particularly bottlenose dolphin research. This intensive training course abroad is developed with varied curricular designs and varied instructional strategies in order to meet specific learning goals. The exclusive FRC learning model helps students to connect the conceptual material presented in this course to case studies, learn field research techniques, collect and analyse field data, and develops holistic and critical thinking skills.

This FRC surveys an extensive amount of information, theories and ongoing investigations concerning the different methods available to characterize the status of a coastal bottlenose dolphin population. Students will be trained during FRC 1001 in a wide range of areas including scientific data collection, field research concepts and methodology, computer orientation, use of statistical analysis, presentation and report of findings, and much more.

Students will be trained during FRC in a wide range of areas including scientific data collection, field research concepts and methodology, computer orientation, use of statistical analysis, presentation and report of findings, and much more. The aim of each FRC is to give the participants sufficient knowledge to apply the appropriate specialized non-invasive dolphin research techniques, analyze, give an interpretation of the results, and a final presentation.

The variety of subjects approached on this course offers a broad view of applied dolphins field research whilst providing students with the tools and practical experience needed for a greater understanding of coastal bottlenose dolphin populations and their conservation, as well as deeper insight into behavioral research concepts and methodology.

2. LEARNING OBJECTIVES

Following this course, students should:

- Select and use an appropriate research method available to characterise the status of a coastal bottlenose dolphin population.
- Design a survey to monitor a coastal bottlenose dolphin population.
- Establish and follow line transect boat-based surveys and explain the importance of experimental design.
- Use the photo-identification technique, and discuss the strengths and weaknesses of this method.
- Extract manually and automatically dolphin dorsal fin outlines from digital photographs, identify individuals and create a catalogue.
- Discriminate the different types of bottlenose dolphin vocalizations by visual and aural analysis of the sonograms.
- Obtain detailed views of dolphins' behavior by focal following (individual and groups).
- Assist the rescue of stranded bottlenose dolphins and direct a group of volunteers in basic first aid procedures.
- Apply appropriate statistical techniques on biological data sets and give an interpretation of the results.
- Create a scientific poster and give a scientific oral presentation.

3. COURSES FORMAT AND ELEMENTS

The academic program is 10 days long, and each day contains activities and assignments designed to increase understanding and application of a given topic. Each day includes some or all of the following elements:

Introduction and Learning Outcomes

The introduction presents an overview of the day's topic, and the Learning Outcomes indicate what you should be able to do by the end of the day that demonstrates your mastery of the topic.

Lectures and Learning Resources

The FRC lectures survey an extensive amount of information, theories and ongoing investigations concerning bottlenose dolphin research. Learning Resources for each day may include to watch videos and to read from scientific articles, PowerPoint slides, etc.

Hands-on activities

A Hands-on Activity often is a practical field or laboratory experiment (i.e. use of GPS onboard to follow a linear transect, quantify vocal repertoire via computer practical sessions).

Discussion

Daily discussion is an important activity based on the underlying belief that students learn from one another, hopefully ending with a constructive brainstorming on the specific topic. For each required

Discussion question, you are required to give a response to the question and to respond to at least one of your colleagues' comments. Note that you are welcome (and encouraged) to respond to more than one colleague. For Discussion in these courses, the instructor may place students into small groups. You will remain in that group for Discussion throughout the course.

Content Review Quiz & Final exam

These quizzes may count toward your course grade whereas some quizzes may be for practice. There may be a quiz every three days and a final exam in Day 10.

Day off

Throughout all courses, one day a week is reserved for studying and relaxing (generally Sundays).

During program time you will find yourself following a rigorous schedule, however, one must be very flexible for changes occur all of the time! Please be aware that the schedule may vary depending on season, weather and FRC priorities. For instance, a windy day may force the staff to cancel a survey at sea and instead conduct hands-on video and computer analysis.

Please try to be flexible and understand that a program dealing with wild animals at sea cannot be 100% predictable. After the first day of orientation, the program will include a minimum of 8 hours of contact field work and lectures each day. Expect to wake up between 6:00 am and 8:30 am depending on the activities scheduled and period of the year. The program is intensive and highly structured. Generally classroom lectures alternate with field sessions. If lectures are before lunch, time after lunch will be in the field and vice versa.

4. EVALUATION AND GRADING SCALE

FRC are rigorous and challenging, and our approach mandates that students demonstrate their knowledge of theory and practice by applying such theory and practice to actual problems. Grades will be determined by a percentage of total points earned on all course elements. As FRC exams are based on application of knowledge, rather than rote memorization, the courses are generally thought of as difficult. Do not expect grading to be similar to your university, many students are surprised by how hard the professor grades.

GRADE	PERCENT	POINTS
A	90-100 %	4.0
B	80-89 %	3.0
C	70-79 %	2.0
D	60-69 %	1.0
E	below 60 %	0

FRC programs are foreign based, field orientated, and require fulltime on site participation in all program activities; therefore, BDRI does not grant incompletes.



ASSESSMENT	NUMBER OF DAYS	VALUE
Participation grade	9	15 %
Field Exercises	6	35%
Lab Exercises	7	35%
Content Review Quiz	3	5%
Final exam	1	10%

Participation grade

Participation in class discussions (6) and lectures (12) factors into this grade, We reserve the right to adjust this grade 15% in either direction.

Field exercises

During these field exercises, the student will be employing methods outlined during the lectures to collect data about presence and distribution of common bottlenose dolphins along the nord-eastern coast of Sardinia, Italy.

Lab exercises

The objective of the lab exercises is to enhance student ability to analyze and present scientific data, and produce a report on the results.

5. ACADEMIC EXPECTATIONS

The academic atmosphere we try to create at BDRI is that of a community of learners. Students come from a wide range of universities worldwide as well as from a variety of academic backgrounds. You will be able to challenge yourself intellectually in areas you are not familiar with and to act in a leadership role in those areas in which you have expertise.

It is strongly recommended that each student keep copies of all written papers, completed tests, assignments, lecture notes, handouts, and reading assignments for the student’s own future use, and for possible discussions with faculty advisors.

BDRI cannot guarantee that students will receive credit for their FRC from their home institutions. It is the responsibility of the student to arrange credit with their home school prior to FRC participation. Students intending to receive academic credit at their home institution should speak with their academic advisor about how to best proceed. Students should allow time to have their FRC program approved by their advisor and other appropriate personnel before the start of the program.

DATA AND EDUCATIONAL MATERIALS OWNERSHIP

BDRI is the owner of all work products developed and research data collected by students while participating in an FRC program or through the use of facilities or funds provided by or through BDRI. No student may utilize these data for any purpose other than scholarly FRC works. The use of these data by students for undisclosed and unapproved personal benefit or commercial application, financially or professionally or in any other way is not permitted.

Students who have collected data during their FRC will have access to all of that specific data (and no other data) for a one year period after completion of their FRC for the explicit purposes of developing these or other scholarly works.

6. COURSE ANALYSIS

DAY	COURSE ELEMENT & TITLE	DESCRIPTION	TIME (HR:MIN)
1	Ice-breaking session	- Registration, basic orientation and information about safety and operational objectives.	2:00
1	Lecture 1: Academic Introduction	- philosophy of the course - conceptual map of learning units - course requirements - study strategies for success	1:00
1	Lecture 2: Cetaceans & Common bottlenose dolphins	- characteristics - ecology & behaviour - physiology & life history	2:00
1	Introduction to the field exercises	- use of scientific equipment - data collection	0:45
1	Video session 1		1:00
2	Field exercise 1: Sighting methods	- dedicated boat based surveys	4:00
2	Lecture 3: Marine environment & Monitoring bottlenose dolphin populations	- nature of marine environment - observation effort & sighting definition - boat based surveys - land based surveys - acoustic methods	1:30
2	Discussion 1: Selecting a monitoring program	- strengths and weaknesses of sighting methods	1:00
2	Video session 2		1:00
3	Field exercise 2: Sighting methods	- line transect sampling	4:00
3	Lecture 4: Abundance estimation 1	- distance sampling	1:00
3	Lab exercise 1: Computer orientation	- introduction to GIS	1:00
3	Discussion 2: Distance sampling	- strengths and weaknesses of these methods	0:45
3	Content Review Quiz 1		0:45
4	Field exercise 3: Sighting methods	- photo-identification methods	4:00
4	Lecture 5: Abundance estimation 2	- mark recapture (photo-identification)	1:30
4	Lab exercise 2: Computer orientation	- fin-recognition software packages - dorsal fins catalogue	1:00
4	Discussion 3: Photo-identification	- strengths and weaknesses of this method	0:45
4	Video session 3		0:45
5	Field exercise 4: Bioacoustics & behavioural sampling 1	- acoustics methods - behavioural sampling & records	4:00
5	Lecture 6: Bioacoustics	- bioacoustics - sounds emission and reception	1:30
5	Lecture 7: Acoustic communication in bottlenose dolphins	- Whistles - Burst pulsed sounds	1:00
5	Lab exercise 3: Computer orientation	- sounds analysis software	1:00



		visual and aural analysis of the sonograms	
6	Field exercise 5: Sighting methods	- land based surveys	4:00
6	Lecture 8: Strandings	- why do bottlenose dolphins strand?	1:00
6	Lab exercise 4: Stranding simulation	- rescue of stranded bottlenose dolphin	1:00
6	Discussion 4: Strandings	- importance of networks	0:45
6	Video session 4		0:45
6	Content Review Quiz 2		0:45
7	Day off		
8	Lecture 9: Bottlenose dolphin behaviour	- behavioural patterns & events - ethogram - predation & depredation	1:30
8	Lab exercise 5: Video analysis	- events & underwater behaviour	0:45
8	Lecture 10: Statistical analysis	- univariate statistics - multivariate statistics	2:00
8	Lab exercise 6: Statistics & Databases	- statistical software - creation of a database	1:30
8	Discussion 5: Statistics	- importance of statistics on field research	0:45
8	Video session 5		1:00
9	Field exercise 6: Behavioural sampling 2	- behavioural sampling & records - interaction with fisheries	4:00
9	Lecture 11: Conservation of bottlenose dolphins	- interaction with human activities - threats faced by dolphins - IUCN status of bottlenose dolphins - bycatch and incidental captures	1:30
9	Discussion 6: Possible solutions to cetacean conservation problems	- Role of the scientists in cetacean conservation	1:00
9	Content Review Quiz 3		0:45
10	Lecture 12: BDRI's Current Research	- Use of habitat & distribution - Communication - Social structure - Interaction with human activities - Opportunistic foraging - Ecological modelling	2:00
10	Lab exercise 7: Creating research reports	- guidelines for creating scientific posters and presentations - publishing in scientific journals	1:30
10	Final exam		1:00
10	Final evaluation and certificate of attendance		