



**The Bottlenose Dolphin Research Institute - BDRI
Field Research-oriented Courses in Marine
Mammals Science - FRC**

FRC 1003 - CONSERVATION AND MANAGEMENT OF BOTTLENOSE DOLPHIN POPULATIONS
SYLLABUS
FACULTY DR. BRUNO DIAZ LOPEZ

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1. Course overview

This advanced field research-oriented course surveys an extensive amount of knowledge and ongoing investigations concerning marine mammals conservation, achieving an integrated approach to address human-bottlenose dolphin conflicts and advice on mitigation. 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 analyze field data, and develops holistic and critical thinking skills.

This FRC 1003 surveys an extensive amount of information, theories and ongoing investigations concerning the different procedures available to manage and monitor coastal bottlenose dolphin population. 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 a result of successful completion of this course, attendants will gain a deeper insight into the various factors influencing the impact of human activities on bottlenose dolphins, and explain the importance of local, national, and international policies that aim to protect bottlenose dolphin populations. By the end of the course, students will be able to design a simple project to assess the impact of human activities on bottlenose dolphins. In addition, course attendants will get experience in using an ecosystem modelling approach to examine the impact of fisheries on bottlenose dolphins and vice versa.

2. Learning objectives

Following this course, students should:

- Design a simple project to assess the impact of human activities on bottlenose dolphin and analyze the steps needed to protect the population.
- Select and use an appropriate method to quantify dolphins by-catch and damage.
- Examine the impact of fisheries and aquaculture on bottlenose dolphins using an ecosystem modelling approach.
- Discuss the various factors influencing the incidental capture of bottlenose dolphins, and explain the importance of local, national, and international policies that aim to protect bottlenose dolphin populations
- Design a simple project to address the incidental capture issue by implementing mitigation methods to reduce dolphin mortality
- Analyze the use of acoustic deterrent devices, their impact on bottlenose dolphins, and discuss their effectiveness



- Determine environmental and anthropogenic variables that may influence the interaction between bottlenose dolphins and human activities
- Create a mass-balance model to characterize the role of dolphins in a coastal ecosystem conditioned by aquaculture
- Monitor the impact on populations using closed mark-recapture methods
- Discuss the effects of the worldwide expansion of aquaculture industry on bottlenose dolphins
- Assist the rescue of stranded bottlenose dolphins and direct a group of volunteers during a full assessment of the animal's condition and basic first aid procedures
- Apply appropriate statistical techniques on biological data sets and give an interpretation of the results
- Explain the importance of the ecological-based approach, and discuss the strengths and weaknesses of this method

3. Course Calendar

Bellow is located a printable course calendar.

DATES	Financial Aid*
1 st March – 10 th March	25%
3 rd May – 12 th May	25%
5 th July – 14 th July	10%
30 th August – 08 th September	10%
25 th October – 3 rd November	25%

* Financial aid: for students and unemployment people, covers a % of the Tuition & Program fee.

4. 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. This course contains two modules. The first module will introduce students to some of the methods available to assess the impact of human activities (fisheries,



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aquaculture and tourism) on bottlenose dolphin populations. In the second module, course attendants will apply all methods on case studies, and perform analyses of example data.

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 viceversa.



5. 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. Because 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 professors grade.

Grade	Percent	Points
A	90–100 %	4.0
B	80–89 %	3.0
C	70–79 %	2.0
D	60–69 %	1.0
F	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	6	35%
Content Review Quiz	3	5%
Final exam	1	10%

Participation grade: Participation in class discussions and lectures 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 applying methods outlined during the lectures on case studies focused on social dynamics and communication.

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.

6. 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 theses or other scholarly works.

7. 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 - case studies - study strategies for success	0:45
1	Lecture 2: Common bottlenose dolphins	- characteristics & physiology - life history & reproduction - ecology & behaviour - habitat & group size	1:30
1	Introduction to the field exercises	- use of scientific equipment - data collection	0:45
1	Discussion 1: Dolphins captivity	- aquariums - swimming with dolphins	0:45
1	Video session 1		0:45
2	Field exercise 1: Sighting methods	- dedicated boat based surveys - line transect sampling	4:00
2	Lecture 3: Observational methods	- observation effort - defining group & sighting - boat based studies - land based studies - photo-identification technique	1:30
2	Discussion 1: Selecting a monitoring program	- strengths and weaknesses of observational methods - natural marks vs tags	1:00
2	Video session 2		1:00

3	Field exercise 2: Sighting methods	- dedicated boat based surveys - gillnets fisheries & trawlers	4:00
9	Lecture 4: Conservation of bottlenose dolphins	- interaction with human activities - threats faced by dolphins - IUCN status of bottlenose dolphins	1:30
3	Lab exercise 1: Computer orientation	- introduction to GIS	1:00
3	Discussion 2: MPAs & bottlenose dolphins	- sustainable use of marine and coastal living resources - marine and coastal protected areas management	0:45
3	Content Review Quiz 1		0:45
4	Field exercise 3: Observational methods	- photo-identification method - boat based line transect sampling	4:00
4	Lecture 5: Competition with fisheries & By-catch	- predation & depredation - fishing effort - by-catch & incidental captures	1:00
4	Lab exercise 2: Computer orientation	- creation of a database - organize interviews with fishers	1:00
4	Discussion 3: By-catch	- problems & solutions	0:45
4	Video session 3		0:45
5	Field exercise 4: Observational methods & fisheries	- dedicated boat based surveys - mariculture	4:00
5	Lecture 6: Bottlenose dolphin behaviour	- behavioural sampling - opportunistic feeding	1:00
5	Lecture 7: Acoustic deterrent devices	- use of ADDs (pingers) - use of AHDs - evaluating the effectiveness	1:00
5	Discussion 4: Ethics & Acoustic deterrents	- research ethics - use of acoustic deterrents	1:00
5	Video session 4		0:45
6	Field exercise 5: Observational methods & interviews	- land based surveys - interviews with fishers	4:00
6	Lecture 8: Strandings	- why do bottlenose dolphins strand?	1:00
6	Lab exercise 3: Stranding simulation	- rescue of stranded bottlenose dolphin - full assessment of the animal's condition and basic first aid procedures	1:30
6	Discussion 4: Strandings	- importance of networks	0:45
6	Content Review Quiz 2		0:45
7	Day off		
8	Lecture 9: Aquaculture & Fisheries	- Mariculture - Small scale fisheries - Trawlers	1:00
8	Lab exercise 4: Video analysis	- respiratory patterns & events	1:00
8	Lecture 10: Ecosystem modelling approach	- mass balance models - EwE	1:30
8	Lab exercise 5: Use of Ecopath	- Introduction to Ecopath	2:00
8	Discussion 5: Ecological modelling	- importance of modelling on marine conservation	0:45
8	Video session 5		1:00

9	Field exercise 6: Behavioural sampling	- behavioural sampling & records - respiratory patterns - interaction with human activities	4:00
9	Lecture 11: Effects of tourism on dolphins	- Behavioural changes - Noise pollution - Marine traffic & whale-watching	1:00
9	Lecture 12: Statistical analysis	- univariate statistics - multivariate statistics	1:30
9	Discussion 6: Science and the conservation of bottlenose dolphins	- role of the scientists in cetacean conservation - responsible tourism - problems and solutions	1:00
9	Content Review Quiz 3		0:30
10	Lecture 13: BDRI's Current Research	- Use of habitat & distribution - Communication - Social structure - Interaction with human activities - Opportunistic foraging - Ecological modelling	2:00
10	Lab exercise 6: Presenting research reports	- students presentation (specific personal project about a selected case study)	2:00
10	Final exam		1:00
10	Final evaluation and certificate of attendance		