



ENGAGE. EXPERIENCE. EMBRACE. EDUCATE.

CIEE Research Station Bonaire, Caribbean Netherlands

Course name: Marine Ecology Field Research Methods
Course number: MARI 3005 BONA
Programs offering course: Summer Tropical Marine Ecology and Conservation
Language of instruction: English
U.S. Semester Credits: 3
Contact Hours: 45
Term: Fall 2017 Spring 2018

rpeac

Course Description

Students apply internationally recognized field research methods in an inquiry-driven approach to understanding tropical marine ecosystems. The course focuses on training students in field observation, data collection, record keeping, and data analysis to study coral reef, seagrass and mangrove communities. During the course, students conduct fieldwork using SCUBA and may be involved in ongoing research projects in collaboration with the Bonaire National Marine Park. Equipment commonly used includes: compasses, transect lines, quadrats, underwater video cameras, fish survey T-bars, writing slates, and benthic corers. Students will become familiar with photographic equipment, underwater housings, and image analysis software. In addition to this, students learn to organize, test, and evaluate data sets and present their findings. While the course introduces students to research diving knowledge and techniques with broad applications, it focuses on using scuba research techniques to better understand coral reef, seagrass and mangrove communities.

Learning Objectives

Upon completion of the course students will have:

- Gained fundamental knowledge, developed skills, and understood the research methodology necessary to conduct underwater scientific investigations, particularly, in tropical marine environments.
- Proficiency in underwater identification of Caribbean fish, corals, coral diseases, algae and major invertebrate groups.
- Experience conducting globally and regionally used methodologies for the study of coral reef, mangrove and seagrass ecosystems.
- Familiarity in the use of underwater equipment and sound knowledge about their limitations, advantages and usefulness under specific conditions.

Course Prerequisites

Open water scuba certification, Advanced and Rescue diving training, AAUS dive medical exam, and DAN diving insurance



Methods of Instruction

The course includes lectures on the various methods we will use. Each lecture is followed by a combination of SCUBA dive(s), snorkeling trip(s), and laboratory sessions during which students gain experience using the method described in the lecture. Students collect their own data and write up their results in reports.

Assessment and Final Grade

1. Exam 1:	30%
2. Exam 2:	20%
3. ID Quizzes (3 total 2.5% each):	7.5%
4. REEF fish data collection	2.5%
5. Short reports:	17.5%
a. Fish behavior report (7%)	
b. Video transect, CPCe (3.5%)	
c. Endobenthos report (7%)	
6. AGRRA field methods and data analysis:	10%
7. AGRRA presentation and panel discussion:	10%
8. Attendance and participation:	2.5%

***Note that a final grade for the course will **not** be given to you at the end of the program. Grades will be sent to your home University and they will handle it accordingly.*

***Late assignment submissions will receive a 10% point reduction per day, i.e. an assignment worth 100 pts turned in one day late will be graded out 90 pts.*

***Files must be named as First Name_Last Name_Subject. For example: John_Doe_AGRRA.*

Course Requirements

Exams 1 and 2

The two exams are non-cumulative and include multiple choice, true and false, short response, and essay questions. The exams include materials from lectures, activities, and readings.

Quizzes

A major component of the course is learning to identify Caribbean fishes, algae, corals, and other invertebrates. Students will have identification quizzes both in the classroom and in the field.

Short reports:

The course includes several short reports on laboratory and field activities. These vary in topic, scope, structure, and may be completed by a group or individual. The reports are no more than one to two pages



ENGAGE. EXPERIENCE. EMBRACE. EDUCATE.

or may consist of a single excel worksheet. Given the variation among these short reports, each one is evaluated differently, but all are graded based on quality, clarity, and logic. Short reports that are turned in late will be penalized with a 10% reduction per day, i.e. an assignment turned in one day late will be graded out of 90%. Specific guidelines for each report will be provided in class and available to the students via a Google Drive folder. Graded assignments will be sent back to students one week after submission.

- 1) Files must be named as *Name_Last Name_Subject*. For example: John_Doe_CPCe. Files named incorrectly will have 5% deducted from the final grade.
- 2) Use *Instructions to Authors* as a guide for formatting figures, figure captions, units, decimal places, and dates.

AGRRA data analysis:

The course includes an intensive data analysis assignment on the health of the fishes and corals in Bonaire. Students will collect data using the protocol Atlantic Gulf Rapid Reef Assessment (AGRRA) over the course of four dives. They then must compile, clean, and analyze their data, create high quality graphs and captions from their data, and present their findings during a panel discussion. Specific guidelines will be provided in class and available to the students via a Google Drive folder. Assignments that are turned in late will be penalized with a 10% reduction per day, i.e. an assignment turned in one day late will be graded out of 90%.

- 1) Files must be named as *Name_Last Name_Subject*. For example: John_Doe_CPCe. Files named incorrectly will have 5% deducted from the final grade.
- 2) Use *Instructions to Authors* as a guide for formatting figures, figure captions, units, decimal places and dates.

Attendance and participation:

Regular class attendance is required throughout the program. Students must notify their instructor beforehand if they will miss class for any reason. Students are responsible for any materials covered in class in their absence. Students who miss class for medical reasons must inform the Course Instructor and the Director and provide appropriate documentation as noted below. Make-up opportunity will be provided to the extent this is feasible.

All unexcused absences will result in a lower participation grade for any affected CIEE course. Due to the intensive nature of the schedule at CIEE Bonaire, unexcused absences that constitute more than 10% of the total course sessions will also result in a lower final grade (1 half-grade per absence beyond the first absence).

Excessively tardy (over 15 minutes late) students will be marked absent. Attendance policies also apply to any required co-curricular class excursion or event. If a student is absent during a lecture, then that student will not be able to attend the activity associated with that lecture including activities that have a graded assignment. Students who miss class for personal travel will be marked as absent and unexcused. No make-up or re-sit opportunity will be provided.



ENGAGE. EXPERIENCE. EMBRACE. EDUCATE.

An absence in a CIEE course will only be considered excused if:

- a doctor's note is provided
- a CIEE staff member verifies that the student was too ill to attend class
- evidence is provided of a family emergency

Persistent absenteeism (students approaching 20% or more of total course hours missed, or violations of the attendance policies in more than one class), excused or unexcused, may lead to a written warning from the Director, notification to the student's home school, and/or dismissal from the program in addition to reduction in class grade(s). Students with unexcused absences exceeding 20% of the total course hours will fail the course.

Academic Honesty:

Students are expected to adhere to CIEE Research Station Bonaire's Academic Honesty Policy. Students found violating the conditions of academic honesty are subject to receiving an "F" for the course. The violation will also be reported to the Director of CIEE Research Station Bonaire, Dr. Rita Peachey, and may be documented on the student's permanent record at their home institution.

The course will have a mix of group and individual assignments. Students are to assume that unless directed to work in groups, all assignments should be completed individually.

Diving:

Students are expected to adhere to CIEE RSB's rules and regulations concerning the dive program. Violations of dive plan (i.e. depth and dive time) as well as practices that are considered unsafe for the student, their buddy and / or the dive team will result in a warning, ending the current dive, not being allowed to partake in the first dive after the violation or - in severe cases - a ban from the dive program.

Weekly Schedule

A detailed schedule of the course is available via Google Calendar at www.cieebonaire.org/news/calendar. Refer to it for weekly events and assignment due dates.

Readings

Lecture	Readings
Reef Monitoring Programs	<p>Hill and Wilkinson. 2004. Methods of ecological monitoring for coral reefs (pages 1-4 and 100-102) –This document is also a very good reference for your IR project in terms of methods you can implement –</p> <p>http://reef.org/programs/volunteersurvey Read the front page</p>
AGRRA Fish ID	Humann and Deloach (Fish ID Book) (Useful reference for ID)
Coral ID	<p>http://agrra.org/background/coralid.html</p> <p>Humann and Deloach (Coral ID Book) (Useful reference for ID)</p> <p>http://coralpedia.bio.warwick.ac.uk/ (Useful reference site for ID)</p>
Coral Disease	Bruckner. 2009. Field Guide to Western Atlantic Coral Diseases –PDF Document– (Useful reference for ID)
AGRRA Benthic and Coral Surveys	AGRRAv5.4 methodology (Pages 5-21)
AGRRA Fish Surveys	AGRRAv5.4 methodology (Pages 22-27)
UW Video Transects	LTR video instructions and ID guide. Read “Instructions” section. Become familiar with the rest of the document (especially pictures and codes).
Fish behavior analysis	Krebs and Davies - Testing Hypotheses in Behavioral Ecology