

Program: Tropical Marine Ecology and Conservation
Location: CIEE Research Station Bonaire
Course Title: Marine Ecology Field Research Methods
Instructors: Caren Eckrich, MS; Rita Peachey, PhD
Contact Hours: 45
Credit Hours: 3 semester/4.5 quarter

Course Description

Students learn to use scuba as a research tool instrumental to understanding the underwater environment. The course focuses on diving safety, learning to collect data underwater, and analysis of the data to understand ecological and biological processes. Equipment commonly used includes: compasses, transect lines, quadrats, underwater cameras and camcorders, T-bars, and writing slates. Students will become familiar with photographic equipment, underwater housings, and image software. In addition to this, students learn to organize and analyze data and present their interpretation of their research. 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 ecology.

Learning Objectives

Upon completion of the course students will have:

- Developed problem management skills, scuba safety skills and scuba equipment handling skills that are required in research diving.
- The ability to conduct research on coral reefs including long term monitoring of reef corals and fish communities
- The ability to properly sample benthic organisms, fish larvae, plankton, and seagrass communities
- The ability to analyze data collected on marine organisms and habitats and to evaluate the results of the research conducted
- Mastered scuba skills and knowledge essential to a full-fledged participation in any project involving research diving.

Course Prerequisites

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

Course Requirements

Lectures and lab are complimentary therefore both lecture and lab attendance are mandatory. You are responsible for knowing: the contents of the readings, lecture materials, and techniques, protocols and species covered in class and in the field. Students who miss a lecture will most likely not be allowed to participate in the following lab/dive, since they are nearly always linked. All assigned readings are available as PDF files on class share and most of the readings are in the library here at CIEE Bonaire. Readings are fundamental to the success of this course and we will assume that you have read them prior to class.

Textbooks

Handouts, articles, and methodologies will be posted on class share.

Methods of Instruction

Lectures, labs/dives and workshops

Assignments: Assignments are due at the beginning of class on the date assigned or at any point prior to that time. Please e-mail assignments to me unless otherwise instructed.

Late assignments will lose 10 points per day.

Skills Assessment: Research Diving Skills such as preparation, ability to collect data using research equipment, equipment care and return, and data write-ups will be evaluated before, during and after dives.

Academic Honesty:

Students are expected to adhere to CIEE Research Station Bonaire's Academic Honesty Policy. Students found violating the CIEE Academic Honesty Policy will receive an "F" for the course. The violation will also be reported to your home institution.

Assessment and Final Grade

Attendance	20%
Mid-Term Skills Assessment	15%
Final Skills Assessment	15%
Assignments	
Site Map	10%
Line Intercept Write-up	2.5%
Observation Dive Write-up	2.5%
Video transect, CPC write-up	5%
AGRRA CARICOMP paper	10%
Final Exam	20%

Schedule

	Lecture:	Lab 1:	Lab 2:	Readings
Jan 19	Introduction, Scientific Diving, AAUS	Skills Dive 1	Skills Dive 2	
Jan 20	Fish ID, AGRRA Fish	Fish ID Dive 1	Fish ID Dive 2	Humann Fish ID – review Fish species handouts AGRRA method – fish section
Jan 21	Coral ID	Coral ID Dive percent cover using quadrats	n/a	Coral Handout, Humann - Reef Coral ID http://coralpedia.bio.warwick.ac.uk/
Jan 22	Diving at Night	Night Dive	n/a	CIEE Dive Safety Manual – Emerg. Plan
Jan 23	Site Mapping, Invertebrate and Algae ID, GPS	Site mapping dive 1	Site mapping dive 2	Invert, reef algae handouts

Jan 26 Site map due	% coral cover data workshop	Invert and algae ID dive	n/a	
Jan 27	ID Review, Line intercept method	Observation dive	Line Intercept Dive	Methods for Ecolog Monit. – pp. 1-26 Leujak & Ormond – Comparative Accuracy of 6 coral survey methods
Jan 28	n/a	n/a	n/a	
Jan 29 Line intcpt & obsv.dive write-ups due	Emergency Plan	ID dive	n/a	
Jan 30	Deep diving skills	Deep dive	n/a	
Feb 10	UW photography and videography, camera care	Videography dive and photo quadrats, skills assessment	n/a	Adventures in Diving UW Photog. & Videography Chapters
Feb 24	No class	No class	No class	
Mar 10	Reef monitoring protocols, AGRRA benthic methodology Coral Point Count software Diving Physics	AGRRA benthic dive	CPC workshop	AGRRA methodology CARICOMP manual The Encyclopedia of Recreational Diving Chapter 4 - Physics
Mar 24	Diving Physiology	Videography Dive	CPC workshop	The Encyclopedia of Recreational Diving Chapter 5 – Physiology
Apr 7 CPC write-up due	AGRRA CARICOMP debate	AGRRA benthic dive and skills assessment		
Apr 28 AGRRA/ CARICOMP paper due	Final Exam			