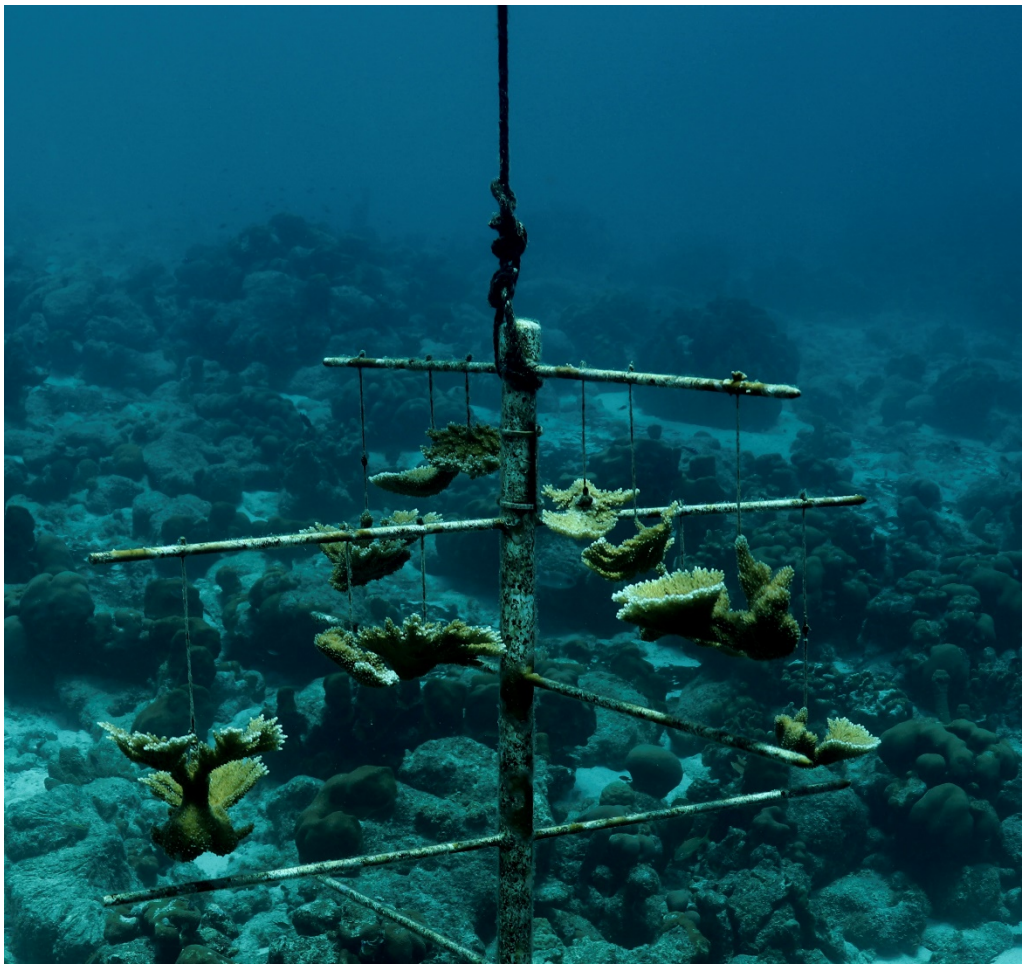
O’Neill SPEA in the Cayman Islands (Little Cayman)

Coral Reef Restoration & Conservation

E482/582 (3 cr.)



Submitted by Stephen ‘Chip’ Glaholt

Indiana University

School of Public and Environmental Affairs

Syllabus

E482/582 O'NEILL SPEA in the Cayman Islands (3 cr)

Spring Break 2020

Instructor: Stephen 'Chip' Glaholt

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Office Hours: by appointment

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Staff Support: Jennifer Mitchner- O'Neill SPEA 460, 855-7980

Classroom: O'Neill SPEA A225

Course Materials:

A. Canvas readings (management plans & scientific articles)
B. Online resources (techniques in research manuals)
C. Mask and snorkel (no gloves or fins allowed)

Course Description:

Over the first nine weeks of the Spring Semester students and instructor will meet for 2 hours each week. These meeting will consist of lectures, discussions, classroom activities (e.g. stakeholder debates among students) and a water safety training session. Lectures will be provided by the instructor, invited guest lecturers (via skype) and student presentations. Take-home assignments will be assigned to prepare students for service and learning on-site at CCMI. Once on-site, students will study research methods in class and in the field, help with the CCMI work on coral restoration, and participate in long-term research projects to help the island maintain its valuable and cherished natural ecosystems. Students will gain experience in coral restoration, as well as, basic research methods such as conducting underwater surveys, running transects, coral bleaching surveys (CoralWatch), fish & coral surveys (AGRRA), and remote underwater visual surveys (BRUV).

A major focus of this program will be coral restoration, in which CCMI is a leader in this field. Two globally endangered coral species, Staghorn coral and Elkhorn coral, are being studied and grown in the CCMI nursery using multiple methods. Students will work in the nursery to learn

restoration techniques and will collect data and conduct maintenance on the out-plantings in which their newly acquired surveying techniques will be applied.

Course Objectives:

Upon completion, each student will be able to:

A. Articulate the major issues facing coral reefs globally and how these issues can be managed or rectified by proper resource management and restoration efforts.
B. Identify and share knowledge about the biodiversity associated with Caribbean marine and tropical terrestrial ecosystems.
C. Apply the scientific method to solve applied environmental issues of various scale.
D. Perform standard field sampling strategies and techniques, as well as, develop statistically sound experimental designs.
E. Clearly articulate the importance of coral reefs in marine ecosystems and ways people are both destroying and saving these valuable ecosystems.
F. Differentiate between an intact and biodiversity rich ecosystem like the ones found on Little Cayman from the more common degraded ecosystems found in the United States.
G. Forever know the beauty and intrinsic value an intact and healthy environment provides people. Something the next generation may never experience!

Schedule:

Eight 2-hr stateside sessions will be conducted on topics including: Course overview, Caribbean fish and coral identification, scientific method, principles of developing research projects, swimming and snorkeling lesson, conservation lecture and trip orientation lecture (which include program rules, safety and security measures, travel details, and housing arrangement). For more detail, see Section D: Orientation Programming of the Proposal.

A detailed daily schedule while abroad can be found below.

Class Policies:

Please consider the following policies to be a contract for this class.

- **Canvas-** used for all classroom administrative needs and updates.
- **Attendance-** attendance to all sessions (**prior and during** overseas activities) is required.
- **Exams-** testing of fish and coral identification will occur during the program.

- **Written and Presentation Assignments-** all written and presentation assignments must be typed, organized, grammatically edited, supported and cited with relevant scientific literature.
- **Courtesy and Ethics-** respect must be exhibited at all times to fellow students, instructors, lectures, staff members, and locals. Disregard for this policy is grounds for immediate removal from the housing or program.

Assignments and Grades:

1. **Tests-** 20% of final grade
   Two identification of biodiversity tests will be conducted. One prior to departure to Little Cayman and the field test while on island to ensure the student's knowledge of the organisms and ecosystems on and around Little Cayman.

2. **Experience Write-up-** 10% of final grade
   At the end of the trip, students will be required to submit a 1-2 page paper documenting their experiences while on Little Cayman. No rules or guidelines because I want this to be reflective and personal. These write-ups will be used to informative the instructors on what experiences affected the students in both positive and negative ways.

3. **Participation-** 20% of final grade
   Based on overall participation, intellectual involvement and contributions during the course. Active participation is mandatory for this program.

4. **Research Proposal & Presentation-** 50% of final grade for undergrads and graduates*****
   ***Graduate students will work on two (group) research projects/presentations, while undergraduate students will work on 1 group research project and presentation.**
   During stateside orientation, students will learn research sampling techniques, identify fish and coral species and develop a research proposal (in pairs) which will include an extensive research of the primary scientific literature on their research question. Students will then spend their time on Little Cayman working with local Cayman scientist and conservation officers learning research survey techniques that they will employ in order to collect their own data to help advance the goals of their research proposal. This research will culminate in a formal scientific presentation.

Tentative Schedule of Pre-Departure Meetings (in O'Neill SPEA A225)

Week	Date	Activity	Contact Hours
1	16 Jan 20 6-8pm	Introductory Meeting: Introductions, Travel Info, Course Goals & Assignments, Project Ideas, and Literature Review.	**2hrs**
2	23 Jan 20 6-8pm	Fish Lecture (by CCMI Staff): Learn the common Caribbean fish species found on Little Cayman, how to perform fish counts, and gain a better understanding of the important role fish play in maintaining a healthy marine ecosystem.	**2hrs**
3	30 Jan 20 6-8pm	Coral Lecture (by CCMI Staff): Learn the common Caribbean coral species, how to conduct transect surveys to estimate coral diversity and coverage, and gain a better understanding of the importance of corals to the global marine environment.	**2hrs**
4	6 Feb 20 6-8pm	Research Lecture (by Instructor Glaholt): Go over the scientific method which includes, among other things, how to define a testable hypothesis and develop a proper experimental design. The goal is to train students how to conduct and also evaluate the validity of scientific inquiries, whether it be by actively conducting research or reading scientific literature.	**2hrs**
5	13 Feb 20 6-8pm	Students will be given a swimming and snorkeling lesson by an IUB Dive and Safety Officer. During this lesson students will work on understanding the risk of snorkeling and how to avoid them to safely enjoy the coastal waters. For a student to participate in sub-tidal activities he or she will be required to exhibit proficiency in both swimming and snorkeling prior to the departure date.	**2hrs**
6	20 Feb 20 6-8pm	Island Conservation Lecture (by CCMI Staff): Introduce the various issues facing the diverse ecosystems on Little Cayman and the current conservation programs designed to combat these issues. Discuss ways students can directly support these conservation efforts through research.	**2hrs**
7	27 Feb 20 6-8pm	Coral & Fish Identification Exam: Students will be required to identify ~50 species of fish and ~15 species of coral commonly found around Little Cayman. Students will also be taking a field fish & coral identification exam while on Little Cayman or via BRUV. This will be followed by discussion about what to pack for the trip.	**2hrs**
8	5 Mar 20 6-8pm	Orientation & Safety Session: Go over "What to expect". Including travel details, housing arrangements, rules of the program, safety and other matters to help students properly prepare for traveling abroad.	**2hrs**
			Total: 16hrs

Tentative Schedule of On-Island Daily Activities

Day	Date	Activity	Contact Hours
1	**14 Mar 20 Saturday**	All Day: Arrival & collection from airport. Introduction to Island, residence and facilities. Evening: Snorkel orientation and review project implementation plan.	2 @ 100% 4 @ 50% =**4hrs**
2	**15 Mar 20 Sunday**	AM: Participate in coral restoration & maintenance of coral nursery (CCMI). Afternoon: Create long-term research underwater survey sights. Evening: Study for Fish and Coral Exam.	6 @ 50% 2 @ 100% =**5hrs**
3	**16 Mar 20 Monday**	AM: Fish & Coral underwater field exam; then ½ day boat snorkel (CCMI). Afternoon: Field trip to marine protected areas and replenishment zones. Evening: Update Method/Exp Design section of research proposal.	2 @ 100% 6 @ 50% =**5hrs**
4	**17 Mar 20 Tuesday**	AM: Perform fish survey transects. Afternoon: Conduct coral survey, including on beach survey (CoralWatch). Evening: Process and analyze fish & coral survey data.	2 @ 100% 6 @ 50% =**5hrs**
5	**18 Mar 20 Wednesday**	All Day: Data collection on projects (i.e. working with conservation groups or conducting underwater surveys). Evening: Conduct coral recruitment survey following AGRRA methodology. PM: Finish outline for final report.	2 @ 100% 6 @ 50% =**5hrs**
6	**19 Mar 20 Thursday**	AM: Mangrove snorkeling trip. Afternoon: Work on research presentations. Local snorkel. Evening: Night snorkel. Finish presentation drafts.	6 @ 50% 2 @ 100% =**5hrs**
7	**20 Mar 20 Friday**	AM: Finalize presentations. Afternoon: Students give formal presentations. Evening: Consolidate student's data and species lists (record species found, location, abundance estimates, and pictures). Dinner at local restaurant.	2 @ 100% 6 @ 50% =**5hrs**
8	**21 Mar 19 Saturday**	Pack-up and clean rooms by 10am. Students Depart Little Cayman.	**Total: 34hrs**

Total Contact Hours: 50hrs

*Student not participating in underwater activities (i.e. snorkeling) will conduct the same research goals (e.g. fish identification) in the intertidal zone (i.e. tide pools) located adjacent to snorkeling sites.

Alternative Lesson Plans: Statistics lecture; islands terrestrial conservation efforts lecture; meet with terrestrial island conservation group working on the invasive iguana.