



Iowa Wesleyan University

ENVI 2943: Tropical Marine Ecology and Conservation

Summer 2020

June 3- June 17

Credit Hours: 3 credit hours

Instructor Contact Information

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DACZM

Required Text:

Materials for this course will come from a variety of sources including Internet sites, peer reviewed journals and hard copies that are available in the extensive field station library. In addition, there are a number of field keys that shall be required but also available in the field station library. Library books cannot be taken into the field. The principle text for this course is given below. We recommend that students purchase at least one of the books listed.

1. Kaplan, Eugene H. 1982. A Field Guide to Coral Reefs of the Caribbean and Florida. Houghton Mifflin Co., Boston, New York.

Other materials used in this course:

1. Goldberg, Walter M. 2013. The Biology of Reefs and Reef Organisms. The University of Chicago Press Ltd. London.
2. Humann, Paul and Ned Deloach. 2014. Reef Fish Identification, Florida, Caribbean, Bahamas. 4th ed. New World Publ. Inc. Fl.
3. Humann, Paul and Ned Deloach. 2013. Reef Coral Identification, Florida, Caribbean, Bahamas. 3rd ed. New World Publ. Inc. Fl.
4. Humann, Paul, N. Deloach and L. Wilk. 2013. Reef Creature identification, Florida, Caribbean, Bahamas. 3rd ed. New World Publ. Inc. Fl.

Iowa Wesleyan University Mission Statement

Iowa Wesleyan University is a transformational learning community whose passion is to educate, empower, and inspire students to lead meaningful lives and careers.

Iowa Wesleyan University is a historic, faith-inspired, four-year university. The university is affiliated with the United Methodist Church with which it shares a commitment to spiritual values, social justice and human welfare.

IW Life Skills

- **Communication:** Students will show proficiency in acquiring, processing, and transferring information in a variety of ways, including written communication, oral communication, and information literacy.
- **Critical Reasoning:** Students will strategically apply critical thinking and problem-solving skills.
- **Civic Engagement:** Students will develop the knowledge, skills, values, and motivation to actively engage in communities to promote social justice and human welfare.

Course Description

Tropical Marine Ecology and Conservation is an intensive, experiential coral reef ecology course that covers a ten-day timeframe and includes classroom, field and laboratory components. The focus is to learn the key biotic and abiotic components of a coral reef system and how they interact. Students will come to understand the worldwide importance of coral reefs as well as their “canary in a coal mine status”. The course explores the current state of the Belize Barrier Reef east of Ambergris Caye and south to Caye Caulker. The biological and ecological history of this reef system will be used to inform attempts to predict its future under varied management strategies. Our local findings will be theoretically applied to all coral reef systems. We will also explore anthropogenic activities that have positive and negative impacts on these ecosystems in general. Lectures will encompass uninformed human activities locally and globally that can be addressed to achieve a more positive outcome for coral reefs.

The effectiveness of social media tools to raise awareness and change behavior will be discussed. Students will leave this program armed with the knowledge, drive and inspiration to contribute to global change from any corner of the earth. They will also have a firm grounding that will help them continue on in this field, if they so wish. The NOAA blog for coral reef scientists (Coral-list) will be used for discussions of current issues and display methods of interacting with leading researchers.

Field work will be mainly snorkeling. As much as eight hours per day will be spent at sea. This is a very physical course. Students should be prepared for rigorous activity with much sun exposure. Because we work exclusively inside the barrier reef seas are calm and sea sickness is uncommon. We will examine and compare different reef locations, using actual MPA’s (Marine Protected Areas) to assess their effectiveness. Video and photographic documentation has become a highly valuable asset in marine environments. Students are encouraged to bring digital, underwater equipment. We will document percent of live coral coverage, abundance of specific coral pathogens, specificity of coral grazers, reef damage due to human activity and much more. Images will form part of a tracking system to determine changes in the reef and specific corals over time. Part of most evenings will be spent reviewing images to improve identification ability and confirm data. Evening briefings will intimately familiarize you with each site to be visited the next day.

Students will have a learning experience at more than a dozen of the most spectacular coral reef locations left on earth. Daily, you will encounter endangered species that only a lucky few will ever see. Your instructors have lived and worked on the edge of the Belize Barrier Reef system for nearly 25 years. The broad ecological concepts we discuss are rooted in the day to day

life and struggle of a marine community shaped by what has become its dominant component, humans.

Course Goals and Learning Objectives

At the end of the course, students should be able to:

- Explain the phylogenetic classification system of coral reef organisms
- Identify the most common and many lesser species found in a Belize Coral Reef system
- Explain their niche and its importance to the reef system
- Describe the complex symbiosis of corals
- Describe the abiotic features that characterize coral reefs, mangrove biomes, and sea grass beds.
- Easily stay informed on the latest research developments and status of coral reef systems
- Explain and communicate the importance of coral reef ecosystems and the threats that endanger them.
- Use your voice and actions as a powerful force to save coral reefs.

In addition, the following Learning Outcomes will be addressed or assessed as part of the course:

Communication Skills

- Oral Communication: Students will deliver a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.
- Information Literacy: Students will show the ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand.

Critical Reasoning

- Critical Thinking: Students will design, evaluate and implement a strategy to answer open-ended questions or achieve desired goals.
- Problem Solving: Students will comprehensively explore issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

Civic Engagement

- Civic Engagement: Students will demonstrate their ability to make a difference in the civic life of communities and develop the combination of knowledge, skills, values and motivation to make a difference in the quality of life of those communities.
- Global Learning: Students will become informed, open-minded, and responsible people who are attentive to diversity across the spectrum of differences, seek to understand how their actions affect both local and global communities, and address the world's most pressing and enduring issues collaboratively and equitably.

Course Policies

Attendance and Participation Policy

In accordance with the IW Catalog and the IW Undergraduate Student Attendance Policy, students are expected to attend all class meetings for which they are registered. This is regarded as a matter of individual student responsibility. As mandated by federal law, all faculty

members are expected to keep accurate records of class attendance. The only excused reasons for absences will be illness that impairs ability to attend and function within the classroom setting; unavoidable personal emergency, or participation in a University-sponsored event.

Students are expected to attend all class sessions on all days of class. It will be the responsibility of the student to contact the course instructor, preferably before the absence, to provide the appropriate documentation and verification for the reason for the absence, and to make arrangements with the course instructor for missed work. Students missing a class session without following this protocol will be subject to limited participation in hands-on practice at the instructor's discretion.

Regardless of the reason for absences, both absences from class will count toward the percentage of allowed absences. A "class" is one class session- some days, there are multiple class sessions. Students are responsible for all missed class material. Students may be subject to limited participation in hands-on practice at the instructor's discretion if they have missed the underlying material needed to safely perform the task at hand.

A warning to the student and student's home university point person may result if the student is absent 12.5% of the total number of class meetings. If a student is absent 25% of the total number of class meetings, the course instructor must notify the Registrar's Office which will initiate the withdrawal of the student from the class with a grade of WF (Withdrawn-Fail).

Grading Scale:

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93-100%	= A	73-76.99%	= C
90-92.99%	= A-	70-72.99%	= C-
87-89.99%	= B+	67-69.99%	= D+
83-86.99%	= B	63-66.99%	= D
80-82.99%	= B-	60-62.99%	= D-
77-79.99%	= C+	59 and below	= F

Assignments and Points

Your course grade will be determined as follows:

Writing Assignment: 20%

Exam: 20%

Student Presentation: 10%

Program Participation: 50%

The exam and writing assignment will be due 10 days after completion of the program. The exam will be online and open book format. The student presentation will occur during the program and you will receive all assignment details and grading rubrics on the first day of the program.

Your supervising veterinarian/instructor will complete a detailed student participation evaluation for your program participation grade. For this evaluation, you will be scored on the following criteria throughout the program:

- *Level of engagement.* You are expected to proactively contribute to class by offering ideas, asking questions, and volunteering answers multiple times each session.

- *Quality of contributions.* A majority of your contributions must be relevant and reflect understanding of the topic, provide insight, draw connections regarding the material, build upon remarks of another student, and/or demonstrate critical thinking skills.

- *Listening Skills.* You are expected to actively and respectfully listen to your peers and instructor, maintaining full engagement throughout the class session or activity.

- *Preparation.* You should always be prepared for class or the scheduled activity with necessary class materials. You should complete all homework assignments on time and be ready to discuss when appropriate.

- *Behavior.* You should never display disruptive or inappropriate behavior during a class session or activity. You should be polite and cooperative with students and the instructor.

Time and Commitment

Class sessions and volunteer activities will take up a large portion of your day. This course will cover a large volume of terms, techniques, and information. We expect that you will find the time you invest to be productive and helpful, both in this class and going forward.

Supplies

You will need proper snorkel equipment to get the most from this course. Good equipment is not inexpensive but relative to other costs it is a small price to pay. We recommend either “Mares” or “Cressi” brands. Other brands may look similar but do not perform as well. **You will need a mask, snorkel and fins.** Do not buy short fins (<15 in.). They do not give adequate propulsion. 15 to 22 inches are preferable. Do not buy full face masks that enclose eyes, nose and mouth. A standard dive mask is required. One model does not fit all. The size and shape of your face is important. A small face calls for a low-profile mask. A large face requires a high-profile mask usually with side lens panels. This type of mask has the advantage of better peripheral vision but will leak with small faces. If you have a local dive shop to go to it is best to visit there but do not buy. Just try on different masks then buy that model on-line more cheaply. A good test of mask fit is to put the mask to your face without the strap in place and breath in through your nose. If the mask seals it will stay on your face due to the suction produced. If the mask you choose presses against your forehead between your eyebrows it is too small and will be uncomfortable. For personal advice you may contact the professor directly. However, we often have some extra equipment for those whose best efforts at selection have failed. For snorkels, most work fine but the simpler, the better.

A terrestrial flashlight is required. We will provide dive lights for night dive only. Also **bring reef safe sunblock** (google it) and bug spray. A hat, sun glasses and beach towel are highly recommended. Have some tight-fitting clothing, maybe lycra, that can be worn in the water if sunblock fails. Don't plan to walk barefoot. We hesitate to require underwater, digital cameras due to their cost, however, they will be most helpful and give you remarkable memories and tales to share.

Technology

You are welcome to use a laptop to take notes in class if you prefer. It is certainly not required. Please ensure that your phone is off during class sessions.

Diversity and Disability Statement

Iowa Wesleyan values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify me as soon as possible. Students with disabilities are eligible for accommodations to help remove learning barriers in the course.

Academic Honesty

Iowa Wesleyan has developed a strict policy to deal with those students who commit acts of academic dishonesty such as plagiarism and/or cheating. Such acts will not be tolerated in any form by the faculty and staff, and will carry stiff penalties. For more information regarding this policy, please consult the most current version of the IW Catalog.

Course Schedule (subject to change):

This is a detailed, daily schedule showing what you can expect each day, but is not set in stone. Nature and other circumstances are not always predictable and plans may have to change to adapt to or take advantage of a changing situation. However, we plan to implement this schedule as it is seen here, while expecting some changes along the way.

Day	Activity	Notes	Reading
Belize arrival, journey to Ambergris Caye			
1	Orientation	Caye Facility orientation / Pool check out & gear orientation / Program Orientation	
2	Snorkeling the Barrier Reef	Shallow water ocean check-out, Field lecture (1) snorkel turtle grass beds, Field lecture (2) snorkel Pillar Coral Site Evening presentations and lecture	Kaplan
3	Snorkeling the Barrier Reef	Field lecture (3) Snorkel Tres Cocos / Coral Survey Evening presentations and Lecture	Reef Coral
4	Snorkeling patch reef MPA	Field lecture (4) Snorkel Mexico Rocks and Playa Blanca / lecture & Beach seine	Reef Fish
5	Snorkel Coral Gardens patch reef	Compare this patch reef system to the MPA	Reef Fish
6	Snorkel Mangrove Isles	Conduct survey / Plankton collection	Kaplan

	/ Night snorkel		
7	Snorkel Tuffy back reef & channel	Conduct Survey	Reef Invert
8	Terrestrial Vegetation survey morning	afternoon beach /intertidal survey	
9	Snorkel Hol Chan, Turtle Rock Island and Shark-ray Alley	Turtles & sharks / Conduct survey / Compare Tuffy Channel to Hol chan Channel (MPA)	
10	Presentation of projects Evaluation Final Exam	Dinner out celebration with town time	
Return to Belize City and airport			