BIOL 200 Coral Reefs

CRN 63471 * 03 Credits

INSTRUCTOR:	David A. Krupp, Ph.D.
OFFICE:	Hale ʻImiloa 121A
OFFICE HOURS:	W 1:00 – 2:00 pm
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EFFECTIVE DATE:	Fall 2016
COURSE WEBSITE:	http://krupp.wcc.hawaii.edu/BIOL200/Biol200.htm

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawaiʻi and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide Oʻahu's Koʻolau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Introduction to the biology, ecology and geology of stony corals and the reef structures they build. Topics include, but not limited to, the following: photobiology, biochemistry, physiology, reproduction, ecology, biogeography and evolution of stony corals; contributions made by other members of the coral reef community, such as algae, invertebrates, fish, sea turtles, sea birds, and marine mammals; reef formation and geomorphology; corals as resources for human utilization and the impacts of human activities upon reefs throughout the world. Emphasis will be on Hawaiʻi's coral reefs, but comparisons will be made among reefs from other areas. (three hours lect.)

COURSE STUDENT LEARNING OUTCOMES

By the end of this class, the student should be able to

- Explain the process and philosophical basis of scientific inquiry.
- Distinguish between living things and inanimate objects.
- Describe the classification of living things, the kinds of criteria used to classify them, and the formal protocol in naming them.
- Demonstrate an understanding of the biology of corals (e.g., systematics & classification, soft tissue morphology and cytology, skeletal morphology, endosymbiosis with zooxanthellae, modes of feeding, reproduction, environmental factors that influence growth and distribution, and evolution) with an emphasis on Hawaiian corals.
- Describe the ecological relationships among the living components of coral reef communities and their interactions with the physical environment.
- Describe the types of reefs and the processes that create and shape them.
- Describe the resources that coral reefs provide, especially to Pacific island nations and states.
- Describe the impacts of human activities on coral reefs and the significance of these impacts to Pacific island nations and states.

SUSTAINABILITY STUDENT LEARNING OUTCOMES

By the end of this class, the student should be able to

- Measure one's impact on the triple bottom line: People, Planet, Profit.
- Apply concepts of sustainability to local, regional and/or global challenges.

REQUIREMENTS SATISFIED BY THIS CLASS

- This class may satisfy the Windward Community College Associate in Arts Degree diversification requirement for a Natural Sciences biological science class (DB).
- This class may partially satisfy requirements for the Windward Community College Academic Subject Certificate in Bio-Resources and Technology, Bio-Resources Development and Management Track (Elective Set II: Environment and Ecology).
- This class may partially satisfy requirements for the University of Hawai'i Marine Option Program Certificate as a marine-related elective.
- This class has been identified as a sustainability-focused class at Windward Community College because of its sustainability-related content.

COURSE LECTURE TOPICS

- How Humans Interpret Nature
- The Nature of Natural Science
- The Characteristics of Living Things
- The Classification of Living Things
- Hawaiian Classification and Naming of Marine Flora and Fauna
- Animal Body Plans
- Characteristics of Phylum Cnidaria and Cnidarian Diversity
- The Anatomy and Morphology of Scleractinian Corals
- Identification of Hawaiian Corals and their Near Relatives
- Coral Nutrition: Heterotrophy
- Coral Nutrition: Endosymbiosis with Zooxanthellae
- Reproduction of Scleractinian Corals
- Basic Ecological Principles
- Environmental Factors Influencing Corals
- Coral Reef Ecology
- Coral Reef Formation and Geomorphology
- Hawaiian Coral Reefs
- Fish Biology
- Human Impact on Coral Reefs: Reef Resources & Local Problems
- Traditional Hawaiian and Modern Reef Management Practices
- Human Impact on Coral Reefs: Global Issues & the Real Problem

MODE OF INSTRUCTION

The previously described outcomes will be achieved through the aid of the following learning activities:

- This class has been *SENCERized* utilizing pedagogies promoted by the Science Education for New Civic Engagements and Responsibilities (SENCER – http://www.sencer.net) program. The learning outcomes are delivered through the lens of the Hawai‘i SENCER (http://sencerhawaii.com) theme: Promoting Island Sustainability Through the Understanding and Application of Hawaiian Indigenous Knowledge and Western Science.
- Lecture presentations and demonstrations (these may be viewed as downloadable podcasts from the course Laulima site).
- Internet-assisted activities and resources (e.g., Laulima and course website).
- Readings from textbook and instructor's lecture outlines and study guides (lecture outlines and study guides downloadable as pdf files from the course Laulima site).
- Engagement essays about capacious topics relevant to coral reef biology and ecology.
- Participation in online reviews and discussions.
- Participation in a field survey of a coral reef.
- Quizzes and examinations assessing the students' understanding of course content.

COURSE TASKS, ASSESSMENT AND GRADING

ENGAGEMENT ESSAYS. The student will complete two essays (25 points each) that deal with capacious topics relevant to Hawaiian coral reef biology and ecology as defined by the posted assignments (posted on the class Laulima site). Each essay will present a thoughtful, objective, well-reasoned, organized and documented point of view regarding each topic. Assessment rubrics, as well as details about submission formats, etc., will provide the student with guidance about how to approach each essay topic. Assignments must be submitted by the assignment deadline. ***Assignments received after this deadline (but before one week after the deadline) will receive an automatic deduction of five points. Late assignments received one week or more after the deadline will not be accepted and the student will receive a score of 0 for that assignment.***

PARTICIPATION IN ONLINE DISCUSSIONS. The student will actively engage in online discussions at least once per week (70 points total). These discussions will involve posting thoughtful comments to a discussion topic posted on the Class Discussion Forum on the class Laulima site. Rubrics for scoring student participation in these discussions will be described on the class Laulima site.

CORAL REEF SURVEY. Students will participate in a quantitative survey of a Hawaiian coral reef environment which will be conducted during the International Union for Conservation of Nature (IUCN) World Conservation Congress to be held September 1-10, 2016. Students unable to participate in the actual survey due to physical or logistical limitations will be provided with an alternative but equivalent activity. All students will complete a technical report (30 points) describing and analyzing the results of the survey (see Laulima Assignments page for details).

QUIZZES. The student will take a minimum of ten quizzes (15 points each; 150 points total) administered through the Internet (Laulima) during specified time periods (but not during class sessions). These quizzes will address the detailed content and major concepts presented in the

lectures, lecture outlines, text readings, and study guide activities. If the student takes more than ten quizzes, (there may be 12-14 quizzes in all) only the best ten quiz scores will be used in calculating the student's total points. Since these quizzes may be taken using home computers connected to the Internet, students may refer to instructional resources (text, study guide, lecture notes, etc.) while taking the quizzes. However, the quizzes will be timed, the student having only 20 minutes to complete each quiz. In general, a quiz will be available for about a week (but the duration of availability period may vary from quiz to quiz). Students should expect to take at least one quiz per week. But sometimes more than one quiz will be posted at the same time. ***No make-up quizzes for missed quizzes will be administered for ANY REASON, including illness or family emergency (the student will receive no score for missed quizzes). Quizzes missed or receiving zeros or low scores because of computer and/or Internet problems may not be made up either. The student should also note that quizzes are only reviewable from the course Laulima site if the student has taken them. The student should not expect to be able to review quizzes that the student has not accessed from the course Laulima site during the quiz availability period.***

EXAMINATIONS. The student will take one midterm examinations (100 points each) and a non-cumulative final examination (100 points) to demonstrate understanding of information presented primarily during lecture half of the course. The final examination will draw on information covered during the last halfof the course. The ***closed-book, proctored*** examinations will be administered through the Internet using Laulima at a University of Hawai‘i Testing Center (or comparable college/university testing center – must be demonstrable to be a legitimate proctored testing site). ***NO RETESTS*** will be given. A student missing an exam because of a documented illness or emergency may be allowed to take a make-up exam. In such a circumstance, the student should make every reasonable attempt to contact the instructor before the exam is administered to the class (or as soon as possible). While make-up exams will cover the same content area as a missed exam, the exam format and specific questions may be different.

The assignment of points will be according to the following protocol:

Engagement Essays	50	points
Quizzes	150	points
Online Participation	70	points
Coral Reef Survey Report	30	points
Midterm Examinations	100	points
Final Examination	100	points
TOTAL	500	points

Letter grades will be assigned as follows:

A	90% or above in total points.
B	80-89.9% of total points.
C	65-79.9% of total points.
D	55-64.9% of total points.

F	Below 55% of total points or informal or incomplete official withdrawal from course.
I	Incomplete; given at the **INSTRUCTOR'S OPTION** when student is unable to complete a small part of the course because of circumstances beyond his or her control. It is the **STUDENT'S** responsibility to make up incomplete work. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change for "I" to the contingency grade identified by the instructor (see catalog).
CR	65% or above in total points; the student must indicate the intent to take the course as **CR/NC** in writing by the end of the 10th week of classes (see catalog).
NC	Below 65% of total points; this grade only available under the **CR/NC** option (see above and see catalog).
N	**NOT GIVEN BY THIS INSTRUCTOR EXCEPT UNDER EXTREMELY RARE CIRCUMSTANCES** (e.g., documented serious illness or emergency that prevents the student from officially withdrawing from the course); never used as an alternative for an "F" grade.
W	Official withdrawal from the course after the third week and prior to the end of the 10th week of classes (see catalog).

Waiver of minimum requirements for specific grades may be given only in unique situations at the instructor's discretion.

Students involved in academic dishonesty will receive an "F" grade for the course. Academic dishonesty is defined in WCC's college catalog.

LEARNING RESOURCES

Required Textbook

Gulko, D., 1998. Hawaiian Coral Reef Ecology. Mutual Publishing, Honolulu, Hawai‘i.

Additional Resources

Lecture outlines (with vocabulary lists and study questions), PowerPoint slides (as pdf files), narrated PowerPoint presentations of the lectures and other resources will be made available on the course CANVAS site.

STUDENT RESPONSIBILITIES

The student is expected to attend and actively participate in all course lectures and activities, and complete all quizzes and examinations on time.

The student is expected to be prepared in advance before the class sessions. Being prepared includes the following: having read text materials (e.g., textbook readings, and lecture outlines) assigned for that day's activities and bringing required work materials (e.g., textbook, handouts, writing supplies, etc.) to the session.

Any changes in the course schedule, such as examination dates, deadlines, etc., will be announced ahead of time in class or on the course CANVAS site. It is the student's responsibility to be informed of these changes. Students should visit the course CANVAS site at least twice per week.

It is the student's responsibility to be informed about deadlines critical to making registration changes (e.g., last day of erase period and last day for making an official withdrawal).

The student should understand that **"INTRODUCTORY" DOES NOT MEAN "EASY"**. Students should expect a level of difficulty comparable to other 100-level science classes intended for majors in the discipline. When difficult concepts and detailed information are presented, it is the student's responsibility to take the appropriate steps to learn and understand these concepts and information.

Science courses at WCC generally require two to three hours of independent private study time for each hour in class. However, because of the nature of the material presented in BIOL 171, more study time may be required (depends upon the student's science/biology background). It is the student's responsibility to allocate the appropriate time needed for study in an environment conducive to quality study. The student must budget time efficiently and be realistic about all personal and professional commitments that consume time.

HOW TO SUCEED IN THIS CLASS

Understanding biological science involves understanding many difficult concepts and vocabulary, not just knowing facts. The student should know that the details to these concepts are important. In addition, the student will be introduced to hundreds of new words. In some cases, words that are familiar in a context other than biology will be introduced in the context of biology. The student will need to understand and use these terms in a biological science context.

While the student will have lecture outlines (downloadable from the course CANVAS site; these also include relevant vocabulary lists and study questions), the student will not succeed in this class without taking careful lecture notes and reading the corresponding material in the textbook. The lecture outlines are not to be used in place of the student's own note taking. As soon as possible (best if done on the same day), the student should copy over these lecture notes filling in gaps and missing information by referring to the lecture outlines and textbook. The student should carefully review these rewritten lecture notes as often as possible. In addition to reviewing these notes before an exam, it would be useful for the student to try to rewrite these notes from memory.

In addition to copying over lecture notes, study activities should include drawing labeled diagrams or graphs that illustrate important biological phenomena (e.g., the internal structure of the cell, the stages of cell division, or the anatomy of the heart). These diagrams need not be works of art, but should clearly illustrate significant information. Before an exam, it would be useful to redraw these labeled diagrams and graphs from memory.

The student should make flashcards for each new vocabulary word presented (refer to lecture outlines for a lists of required terms). On one side of the card, write the word. On the other side, write the appropriate biological science definition for the word. The student should use these card for self-testing as often as possible. The student should also practice using the words to

explain biological concepts.

The student should do all of the recommended study guide activities and review all of the Internet resource materials provided.

The textbook and the lecture outlines include useful study questions. The student should write out answers to all of these questions as though they were required assignments. Students could exchange these answers and provide constructive feedback to each other.

The student should read the textbook materials corresponding to a particular lecture before and after that lecture.

Students are recommended to establish study groups and study together. The students in these groups may test each other's knowledge and understanding of the information. They may also take turns teaching each other.

The student should ask the instructor to explain the things that the student does not understand.

DISABILITIES ACCOMMODATION STATEMENT

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, lemke@hawaii.edu, or you may stop by Hale ʻAkoakoa 213 for more information.