Windward Community College

**Outline of Course Objectives**

**BIOL 200 (CRN 64331) Coral Reefs** Spring 2012

TR 1-2:15

ʻImiloa 123

**INSTRUCTOR:** Michelle Smith

**OFFICE:** ʻImiloa 136

**OFFICE HOURS:** TR 8:30-10am, F 11:15-12:15

**EMAIL:** miliefsk@hawaii.edu

**EFFECTIVE DATE:** Spring 2012

**CREDITS:** 3 credit hours for lecture (1 credit hour for 2 hour 45 minutes lab)

**INSTRUCTOR’S WEB PAGE FOR POWERPOINT LECTURES:**

http://www.wcc.hawaii.edu/facstaff/miliefsky-m/

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**WINDWARD COMMUNITY COLLEGE MISSION STATEMENT**

*Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai‘i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide ʻOʻahu’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 Hawaii’s coral reefs, but comparisons will be made among reefs from other areas.

**REQUIREMENTS COURSE SATISFIES:**

- 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.
- Partially fulfills the University of Hawai‘i’s Natural Science general core requirements. This class counts as a biological science lecture course at most campuses. The core requirement for a natural science laboratory may be achieved by taking the companion lab class (BIOL 200L).

**RECOMMENDED SPECIAL PREPARATION:** High school biology, high school chemistry, and high school algebra.
RECOMMENDED BASIC SKILL LEVELS: Reading Level of Text (s): College Level
PREREQUISITES: No prerequisites.

LEARNING RESOURCES

Required Texts

Recommended Texts

STUDENT LEARNING OUTCOMES

The student learning outcomes are
- 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.

COURSE GOALS

Upon completion of this course the student should understand and appreciate the special characteristics of coral reef environments, especially Hawaiian reefs. These special characteristics may be articulated in the following concepts: coral reefs are oases of high biological productivity and diversity in the midst of oceanic deserts; the tiny architects of these reefs, the coral polyps, in concert with coralline algae and other organisms, slowly create the largest structures built by living things; while coral reef biologists debate the fragility and robustness of coral reefs, many biologists now recognize that reefs around the world are threatened by the chronic effects of ever-increasing human impacts.

COURSE CONTENT

Course Content and Topics
- The Nature of Natural Science
- The Characteristics of Living Things
- The Classification of Living Things
- 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
• Fish Biology
• Human Impact on Coral Reefs: Reef Resources & Local Problems
• Human Impact on Coral Reefs: Global Issues & the Real Problem

MODE OF INSTRUCTION

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

1. Assigned readings
2. Class lecture and demonstrations
3. Webpage resources

The material presented in all modes of instruction will be of an introductory nature but sufficient in content to allow serious study by the interested student. Assigned readings will serve to provide background and supplemental information to provide a broad base for a basic study of coral reefs. Class lectures will build upon this base, helping to focus the student to some of the more important details.

ASSESSMENT TASKS AND GRADING

EXAMINATIONS. The student will take four non-cumulative examinations worth 100 points each to demonstrate understanding of information presented during lectures and assigned readings. These examinations, which will be administered during a scheduled class session (see course syllabus). Exams are closed book, but the student is allowed a 1-sided 3x5” note card. Note cards that are double-sided will be thrown out and those larger than 3x5 will be cut down to size. NO RETESTS will be given. A student missing an examination because of an illness or legitimate emergency may take a make-up exam only during the FIRST class meeting to which the student returns. 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.

ATTENDANCE. Attendance is mandatory. If a class is to be missed the Instructor must be notified and as to the reason why. Attendance is worth 100 points toward your final grade. Each unexcused absence will result in a deduction of 10 points.

EXTRA CREDIT ASSIGNMENTS

There are four assignments worth up to 4 percentage points for each assignment. Each assignment is to be turned in on the day of the exam. They can be turned in early, but late submissions will not be accepted. For instance, if you received an 85% on an exam and 5 points on the extra credit. You now have a 90%.

1. Attend a lecture at Waikiki Aquarium, Hanauma Bay Education Center, participate in a beach or algae cleanup… or
2. Review an article related to class content (e.g., Discover magazine, National Geographic, local paper...). Online internet articles are O.K.
3. Write a 1 page summary-reaction paper, typed, double spaced, size 12 font. Attach article to your paper (photocopy or cut it out).

ASSIGNMENT: Review a scientific article related to class content. The article may be from any **scientifically reputable** periodical or publication (e.g., Discover, Time, Newsweek). Legitimate online sites such as cnn.com or newsweek.com are acceptable, but not Bob’s marine biology website. Ask your instructor if you are unsure which types of publications are acceptable. Write a 1 page summary-reaction paper, typed, double spaced, size 12 font. Attach article to paper (photocopy it or cut it out).

**METHOD OF GRADING**

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

- Lecture Examinations (four @ 22.5 points each).............. 90 points
- Attendance (10)................................................................. 10 points
- TOTAL.............................................................. 100 points

Letter grades will be assigned as follows:

**Grading Scale:**

<table>
<thead>
<tr>
<th>Total Points</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-90</td>
<td>A</td>
</tr>
<tr>
<td>89-80</td>
<td>B</td>
</tr>
<tr>
<td>79-70</td>
<td>C</td>
</tr>
<tr>
<td>69-60</td>
<td>D</td>
</tr>
<tr>
<td>59-0</td>
<td>F</td>
</tr>
</tbody>
</table>

Students involved in academic dishonesty will receive an "F" grade for the course.

**STUDENT RESPONSIBILITIES**

Students are expected to be prepared in advance when they arrive to class. Being prepared includes the following: having already read text materials (e.g., textbook readings and handouts) assigned for that day's activities; and bringing required work materials (e.g., textbook, handouts, writing supplies, etc.).

Any changes in the course schedule, such as examination dates, deadlines, etc., will be announced ahead of time in class. It is the student's responsibility to be informed of these changes.

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.

Please be considerate to other students by turning off any Cell Phone devices or Beepers during class. If yours does go off, be prepared to make amends to the entire class. The instructor will explain in more detail.

The student should understand that **"INTRODUCTORY" DOES NOT MEAN "EASY"**. The student should not assume that the lack of prerequisites for this class ensures a low level of difficulty for this course. While the instructor assumes that students enrolled in BIOL 200 have little or no science backgrounds, the students should expect a level of difficulty comparable to
other 200-level science classes. 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 W.C.C. generally require two to three hours of independent private study time for each hour in class (depends upon the student's science 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 SUCCEED 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, the student will not succeed in this class without taking careful lecture notes and reading the corresponding material in the textbook before and after the lecture. The student should carefully review these lecture notes as often as possible. In addition, the students’ study activities should include: drawing labeled diagrams or graphs that illustrate important biological phenomena (e.g., asexual reproduction of the coral polyp, or coral zonation), reviewing all of the internet resource materials provided, and making flashcards for each new vocabulary word presented (refer to lecture outlines for a list 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 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.

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.

Don't wait until the last minute to carry out the written assignments.

Other reading materials may be handed out in class, placed on reserve in the library, or accessed from web pages (see http://www.wcc.hawaii.edu/facstaff/miliefsky-m/).

ACADEMIC DISHONESTY

Students involved in academic dishonesty will receive an "F" grade for the course.

Academic dishonesty includes cheating on exams and plagiarism. See page 16 of the 2011-2012 course catalog for a description of the University's policies concerning academic dishonesty.

ACCOMODATION FOR STUDENTS WITH DISABILITIES
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 ‘Akoakoa 213 for more information.

**TWO-WAY COMMUNICATION DEVICES:**
These devices are not allowed in the classroom. Please see to it that these devices are turned off while in class.

**UH POLICY ON EMAIL COMMUNICATION:**

The electronic communications policy adopted in December 2005 establishes the University of Hawai‘i Internet service as an official medium for communication among students, faculty, and staff. Every member of the system has a hawaii.edu address, and the associated username and password provide access to essential Web announcements and email. You are hereby informed of the need to regularly log in to UH email and Web services for announcements and personal mail. Failing to do so will mean missing critical information from academic and program advisors, instructors, registration and business office staff, classmates, student organizations, and others.