OCB 1001
INTRODUCTION TO MARINE BIOLOGY
SYLLABUS

Course information

Number: OCB 1001
Title: Introduction to Marine Biology
Credit hours: 3
Contact hours: 45

Course pre-requisites:

High school diploma and acceptance to Sea|mester Programs

Course Overview:

This course is designed to introduce students to the diversity of marine life and integrate current issues and practical activities to teach biological and ecological concepts. Topics covered include basics of ecology and evolution, the marine environment, taxonomic classification of marine organisms, survey of major marine ecosystems, and marine conservation. Material will be delivered in interactive lectures, and many will be reinforced with practical activities. Ecosystems and taxonomic groups that are found locally will receive special emphasis. Many topics will also be addressed through written assignments followed by class discussions. This course is appropriate for non-science majors.

Course Objectives:

- To provide an overview of marine diversity and the evolutionary processes that led to this diversity
- To present major marine ecosystems, including trophic relationships of their inhabitants and adaptations for various environmental conditions
- To increase awareness of anthropogenic impacts in the marine environment and potential solutions

Course Outcomes:

By the end of this course, students will be able to:

a. Explain basic concepts of evolution and diversity
b. Describe the major taxonomic groups of marine organisms, including their adaptations to their environment
c. Recognize the evolutionary relationships between groups of marine organisms
d. Describe the physical characteristics, dominant organisms, and trophic relationships in major marine ecosystems
e. Identify reef invertebrates and fishes common in the Caribbean (or where the course takes place)
f. Read primary scientific literature in marine biology and synthesize key points on a given topic

Required Material:

(1) Introduction to Marine Biology, 4th edition. Karleskint, G., Turner, R., and Small, J.W., 2013. Oxford University Press. 563pp. ISBN10: 1133364462

(2) The Reef Set: Reef Fish, Reef Creature and Reef Coral (3 Volumes). DeLoad N and Humann P. 1250 pp. ISBN-10: 1878348337.

(3) Mask/fins/snorkel for snorkeling/scuba diving.

Course Evaluation:
The course will consist of 100 total points, consisting of lecture exams, an identification quiz, papers, and a field logbook.

Exams (60 points): There are four regular lecture-period exams that are each worth 15% of the final grade. Exams are non-cumulative. Students are responsible for all material covered in lectures and practical activities, as well as the lecture notes provided.

Short essays (20 points): Two mandatory short essays will be assigned during the semester on current topics in marine ecology and conservation. Each will be worth 10 points for a total of 20 points. A third, voluntary short essay may be assigned to Students who wish to improve the grade from either of their previous two submissions. Expectations for these essays are detailed at the end of this syllabus (under "Marine Biology Short Essays: Goals and Instructions")

ID Quiz (5 points): Students will be asked to learn to identify reef fishes and invertebrates that are common in the Caribbean (or where the program is held). Species identification will be taught in lecture. Students will have the opportunity to practice ID on various dives, and to review using onboard ID books. Students will then be tested on species identification through a 50-question visual quiz.

Field ID logbook (15 points): Students will maintain a logbook to keep track of marine species they identify during the semester. Scuba dives will be a great opportunity for identification, but seabirds and marine mammals seen from the shore or ship are also acceptable. See details of field book expectations at the end of this syllabus (under "Guidelines for Marine Biology Field Logbook").

Excused absences

Given the nature of this course, we expect students to participate in 100% of the activities and make-ups will be difficult to arrange. Should a student become ill or be in any other way unable to continue participating in the activities, the instructor will evaluate options to complete the course on a case-by-case basis. Excused absences, which are acceptable reasons for requesting a make-up, normally include medical (individual or immediate family only; documented), legal (accident or court case; individual only; documented), funerary (immediate family only; documented), military (call to active duty; documented), religious (customarily-observed holidays; absence pre-arranged with instructor). The reason for requesting a make-up must relate specifically to the time period of the missed coursework and must be documented in writing by an involved professional, when documentation is required. The instructor retains the right to make additional inquiries concerning the documentation.

Grade Cut-offs:

Earned Points	*Letter Grade*
90-100	*A*
80-89.9	*B*
70-79.9	*C*
60-69.9	*D*
Below 60	*F*

* F or FF also assigned for serious academic misconduct

There is no curve in this course and students WILL NOT be awarded a higher letter grade simply because they are close to the next highest grade. However, if the exams turn out to be more difficult than anticipated, the individual exam grades may be adjusted upwards. The absence of a curve guarantees that students who earn 90 points will receive an 'A' regardless of the grade distribution

Dishonesty Policy:
Sea|mester expects all members to behave with academic integrity. Should we find evidence of academic misconduct (cheating, or complicity in academic dishonesty) by a student, we will inform the student of the action to be taken. Cheating on an exam will result in a grade of F for the course. If the offense is extremely serious, charges against the student will be brought before the Operational Director and Sea|mester Director. Consequences can include expulsion from the program.

Students with Disabilities:
Sea|mester accommodates the special needs of students with documented disabilities. Students with special needs should meet with the instructor, preferably prior to the start of the course, to make arrangements to accommodate those needs.

Intellectual Property:
Students are not permitted to take notes or record lectures by any means for the purpose of sale.

Electronic Devices:

Personal computers may be used during lectures for taking notes and other class related activities only. Use of cell phones, including texting, is prohibited at all times during the class.

Disruption of the Academic Process:
Students are expected to show proper respect for the Instructor and for other students. Punishment will be imposed for disruption of academic process of any kind.

'Disruption of academic process' is defined by the University as an act, words, or general conduct of a student in a classroom or other academic environment which in the reasonable estimation of the Instructor: (1) directs attention from the academic matter at hand (e.g., noisy distractions; persistent, disrespectful or abusive disruptions of lecture, exam, or academic discussions) or (2) presents a danger to the health, safety, or well being of self or other persons. Students coming to class late or leaving class early can be a disruption of academic process and can be dealt with accordingly.

Department guidelines for punishment are based on the Sea|mester Student Handbook. If the unacceptable conduct is serious enough to warrant dismissal from the course, then the student shall receive a final grade of "W," if he/she is passing the course, and a final grade of "F," if he/she is not passing the course.

General Instructional Guidelines:
This course adheres to the instructional guidelines posted in the Sea|mester Student Handbook.

Tentative Schedule (exact timing depends on semester):

Week #	Topics	Associated chapter in Sea|mester lecture notes
1	Science and Marine Biology	1
	Fundamentals of Ecology	2
	Mark-recapture practical	
	Biological Concepts	3
2	Taxonomic key practical	
	Marine Micro-organisms	4
	Plankton practical	
	Periphyton practical	
3	Multicellular Primary Producers	5

	Seaweed diversity practical part 1	
	Exam 1 (Logbook submitted with at least 10 species)	Chapters 1-5
	Sponges, Cnidarians and Comb Jellies	6
4	Porifera lab	
	Worms, Bryozoans and Mollusks	7
	Cephalopod dissection	
	Arthropods, Echinoderms and Invertebrate Chordates	8
5	Marine fishes	9
	Identification of local reef fish and invertebrates	
	Reef fish and invertebrate ID practice	
	Reef fish and invertebrate survey	
6	Marine Reptiles and Birds	10
	Fish dissection	
	Marine Mammals	11
	Exam 2 (Logbook submitted with at least 20 species)	Chapters 6-11
7	Intertidal Ecology	12
	Intertidal ecology field trip	
	Estuaries	13
	Coral Reef Communities	14
8	Coral Reef Communities	14
	Coral Zonation practical	
	Continental Shelves and Neritic Zone	15
	Continental Shelves and Neritic Zone	15
9	The Open Ocean	16
	The Open Ocean	16
	Exam 3 (Logbook submitted with at least 30 species)	Chapters 12-16
	Life in the Ocean's Depths	17
10	Life in the Ocean's Depths	17
	Marine birds and mammals of polar seas	18
	Polar seas	18
	Seaweed diversity practical part 2	
11	Marine Biodiversity, fisheries and climate change	19
	Other threats to Marine Biodiversity	20
	Marine Conservation	21
12	Conservation of Tropical Marine Ecosystems	22
	Exam 4 (Logbook submitted with at least 40 species)	Chapters 17-22

Marine Biology Short Essays: Goals and instructions

This is a series of short (1-2 pages) essays designed as an introduction to scientific writing, while reviewing various issues influencing the marine environment. All references are provided and you are expected to read all of them prior to writing your paper. You may find that some references are contradictory, in which case you should review the various sides of the argument and draw your conclusions based on the information presented. Critical thinking is part of this exercise, you should not solely repeat what each paper says, but rather integrate the various references into one cohesive review. Direct quotes should always be avoided, unless you really must repeat what an author said word for word. You may also find that some parts of a paper are more relevant than others; focus on what seems the most relevant to you, it's part of the exercise.

Use the feedback you receive on your first papers to improve subsequent ones. Moreover, the writing style will be the same for your OCE papers, so use the comments on your short Marine Biology essays to improve the quality of your Oceanography literature review papers, and vice versa. These short essays are different from your literature reviews in that they do not review all available literature on a broad topic but rather focus on a few articles on a very specific issue.

Refer to Hoegh-Guldberg (2006) as an example of the type of review expected in this exercise.

The paper should be 1-2 pages long, typed in Times New Roman, 12 font, 1.5 spaced, fully justified with 1.2 inch margins.

You will be evaluated on your written paper as well as on the class discussion following the assignment.

General Tips on Scientific Writing for OCE and OCB

When writing scientific papers it is preferable not to speak in first person, such as "I think that artificial reefs are beneficial…" but rather "artificial reefs have been shown to be beneficial…" Moreover, when discussing other people's work concentrate on the points being made, rather than a 'he-said she-said argument'. You should avoid "story telling" and summarizing one paper and then the other, e.g. "Von Hippel and Von Hippel presented a paper and they have concerns over……. Hoover then published a paper saying that…..". Instead you must integrate your ideas and be more succinct and scientific; "It has been proposed that Viagra could lead to

a marked reduction in the trade of threatened species (Von Hippel and Von Hippel, 2002); the interpretation of this data has been criticized …… (Hoover, 2003)". Be concise and to the point, do not repeat yourself unnecessarily.

References

When referring to from these articles you must use in-text citations. In your essays, every time you refer to someone else's work you need to cite the author. For example: "There was a 72% decline in the sales of reindeer antler velvet from 1997 to 1998, coincident with the entry of Viagra to the markets (Von Hippel and Von Hippel, 2002)".

In-text citations will have one of the three following formats:

- For one author, write down the author's name followed by the year of publication: (Hoover, 2003)
- For two authors, write down both authors' names followed by the year of publication: (Von Hippel and Von Hippel, 2002)
- For more than two authors, write down the name of the first author followed by et. al., then the year of publication: (Mumby, et. al., 2006)

You will need a new citation every time you refer to a different author even if that occurs within the same sentence, i.e.: "Fishing is the most widespread human exploitative activity in the marine environment (Jennings & Kaiser 1998), and the evidence is that many fisheries around the world are in decline (e.g. Botsford et al. 1997)."

When more than one paper is being referenced they should be in order of date, e.g. "Viagra is less expensive than many animal products and its effectiveness is demonstrated (Giuliano et al. 1997; Morales et al. 1998; Sadovsky et al. 2001) rather than hoped for".

If you use information from a paper that you didn't actually directly read, but read it in another paper, then it must be referenced like this; (Alcala, 1988; cited in Gomez, 1997).

Each new point should have at least one in-text citation unless common knowledge. You should reference the same author multiple times if you write several sentences that come from the same source.

Reference Section

All papers used in your essay must be referenced in a list at the end of your paper, alphabetized by authors last name and then by date.

For journal articles: Authors. Year. Name of Article. Name of Journal Volume # (Edition #): pages.

- With one author: Gonzalez, F. I. 1999. Tsunami! Scientific American 280 (5) 56-65.
- With two authors: Giese, G. And Chapman, D. 1993. Coastal Seiches. Oceanus 36 (1) 38-46.
- With more than two authors: Schlee, J.S., Folger, D.W., Wilson, W.P., Klitgord, K.D. and Grow, J.A. 1979. The Continental Margins of the Western North Atlantic. Oceanus 22 (3) 40-7.

If in doubt, refer to Von Hippel, F.A and Von Hippel W. 2002. Sex, drugs, and animal parts: will Viagra save threatened species? Environmental Conservation 29(3):277-281 (1st article of marine biology essay #1, in marine biology reader) and follow the same reference format.

Guidelines for Marine Biology Field Logbook

The following are guidelines on how to layout and complete your field logbook:

Divide the notebook into 2 sections:

1) Narrative section – in which you record a description of where & when you saw the organism, its behavior and a sketch.

2) Species Account section – in which you give a description of the species, getting the information for a book or staff.

In the narrative section of your field journal you should record the specifics of the observation:

- Date of observation
- Physical characteristics, e.g. sea state, cloud cover, depth, visibility, temperature, weather, etc
- Time at which you saw it
- Family, Genus and Species name (Common and Latin)
- Habitat where it was (coral reef, sand, seagrass bed)
- Color, size, other description
- Personal descriptive account of the species and any interesting comments and observations you made in regard to its appearance or behavior

You should also do a quick sketch of the organism to help you remember what it looked like. Even if you're not a good artist, draw what you can and make your description that much nicer! (It may be useful to put a piece of paper over a book illustration and trace).

In the species account section of your field journal, you should include more general information on the species, which you can obtain from the identification:

- Size the species can reach
- Depth and geographical range
- Any behavioral and/or lifestyle notes (feeding, reproduction)
- Any other interesting and relevant information

You should aim to include several entries for each marine biology practical activity, with a **minimum of 10 new entries every time you submit your journal** (during each of the exams). In addition to formal practical activities, you should try to include other organisms you see on dives, walks on the beaches, passages, etc.