

# Marine Ecological Processes

## FAS 6932 (3 credits) Fall 2011

### Course Description

Focuses on the ecological and environmental processes that drive individual behaviors, population dynamics, and community structure in marine ecosystems.

**Prerequisite:** Graduate student status

This course is intended to provide graduate students with a broad overview of ecological processes operating in estuarine, nearshore coastal, and open ocean systems. Initially, students are introduced to important primary producers and secondary consumers in each of these systems. Insights into physiological and population levels of organization build on these basics. Environmental factors that influence species-specific and population level interactions are discussed as a transition to the concepts of community organization. All of this material forms a foundation for explaining how the structure and function of communities are maintained over different scales in both time and space.

### Instructor

Dr. Donald C. Behringer, Assistant Professor  
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Office: SFRC Fisheries and Aquatic Sciences, Rm. 24, Building 544  
Telephone: 352-273-3634  
Office hours: Wednesday 11:30 – 1 pm

### Student Learning Outcomes

At the end of this course, each student will:

- Understand how ecological processes operate in the marine environment
- Know how ecological processes are unique and similar in the marine environment relative to terrestrial and freshwater ecosystems
- Understand the function of the environment in ecological processes
- Hypothesize the outcomes of biotic or abiotic perturbations on populations and communities based on understanding of the ecological processes
- Know the organisms that represent the trophic levels of a marine food web and their interrelationships.
- Understand the role of time and space in marine ecological processes
- Have an understanding of contemporary issues in marine ecology such as conservation, climate change, and disease.

**Course Meeting Times** WF 5/6

### Required Texts/Readings

1. Valiela I (1995) Marine Ecological Processes (2<sup>nd</sup> Edition). Springer-Verlag, New York.

2. Additional primary literature (1 – 3 journal articles) will be assigned to complement or supplement each chapter of the text. The instructor will provide this material the week prior to its coverage in class.

## Course Format, Policies on Attendance and Make-up Exams

### Course format:

The format of the course will be classroom presentation of the subject matter with class discussion. Upon conclusion of each chapter or subject the class will critically discuss primary literature provided by the instructor.

A field trip will be taken midway through the semester to Cedar Key. During the field trip students will be exposed the organisms, habitats, and processes they have learned about during the course. This trip will be arranged at the beginning of the semester to fit the schedules of all students.

### Attendance Policy:

Regular attendance is required at all class meetings and any field trips.

### Make-up Policy:

Students must request permission to make-up an exam or assignment *prior* to missing it. If prior permission is not granted the student will receive 0 points for the exam. Late assignments **will not** be accepted without prior consent of the instructor. Extenuating circumstances will be addressed on a case by case basis.

## Assignments

### Critical Thinking Questions:

Bi-weekly critical thinking questions will be given after the conclusion of the lecture every other Friday. The questions will be drawn from either the lecture material or the assigned reading from the previous two weeks. Each student will be expected to provide an answer to the question the following Friday. See schedule below for due dates.

### Chapter Outlines:

To ensure that students are prepared for class and able to contribute to discussions they are required to submit a detailed outline of each chapter prior to its coverage in class. See schedule below for due dates.

### Field trip presentation:

This assignment will help graduates students learn how to present material to a class in a field setting by requiring them to work as a group (2 – 3) to create and present a field-based lesson to the class during the field trip in October. Students will be given a list of potential topics to select from, but may select a novel topic with the approval of the instructor. Students must select a topic by September 23<sup>rd</sup> and turn in a plan for their presentation by October 7<sup>th</sup>. The presentation must be 20 minutes in length. Detailed instructions for the project will be provided. The presentations will be graded as follows:

- Preparation and organization of material (15 pts)
- Content of presentation (15 pts)
- Presentation delivery (15 pts)

**Literature Discussion:**

We will dedicate the second half of most Friday class meetings to group discussion of the primary literature assigned for that week. Each student will lead the discussion once and be evaluated on:

- Preparation and knowledge of the material (10 pts)
- Organization and flow of discussion (10 pts)

**Exams:**

The mid-term exam will cover all of the material presented to that point.  
The final exam will cover all of the material presented in the course.

**Evaluation of Student Learning**

100 points	Mid-term exam
110 points	Chapter outlines (11 @ 10 points each)
45 points	Field trip presentation
100 points	Critical thinking questions (5 @ 20 points each)
20 points	Lead primary literature discussion
<u>100 points</u>	<u>Final exam</u>
<b>475 points</b>	<b>TOTAL</b>

**Grading Scale**

An “A” represents significant scholarly achievement and will require a minimum numerical score of 90% or better. To earn a “B” [the minimum acceptable performance level for a graduate student], overall numerical scores in the range of 80 to 89% need to be achieved. Numerical grades less than 80% will be assigned letter grades in the “C” range, or below, as appropriate.

Grades will be assigned based on the percentage of the total points earned.

For additional information on the university grading policy please see:  
<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

**Schedule of Class Topics**

<b>Week 1:</b> Course Introduction, Scheduling, and other Logistics	Aug 24
Chapter 1: Primary Producers in Marine Environments	Aug 26
<b>Week 2:</b> Chapter 1- Primary Producers in Marine Environments ( <i>Chapter 1 outline due August 31</i> )	Aug 31 & Sep 2

<b>Week 3:</b> Chapter 2- Factors Affecting Primary Production <i>(Chapter 2 outline due September 7; Weeks 1/2 Question due Sep 9)</i>	Sep 7 & 9
<b>Week 4:</b> Chapter 2- Factors Affecting Primary Production...continued	Sep 14 & 16
<b>Week 5:</b> Chapter 3- Consumers and Dynamics of Consumer Populations <i>(Chapter 3 outline due September 21; Weeks 3/4 Question due Sep 23)</i> <i>(Field presentation topic due September 23<sup>rd</sup>)</i>	Sep 21 & 23
<b>Week 6:</b> Chapter 4- Competition for Resources Among Consumers <i>(Chapter 4 outline due September 28)</i>	Sep 28 & 30
<b>Week 7:</b> Chapter 5- Feeding and Responses to Food Abundance Chapter 6- Food Selection by Consumers <i>(Chapters 5 and 6 outlines due October 5; Weeks 5/6 Question due Oct 7)</i> <i>(Presentation plan due October 7<sup>th</sup>)</i>	Oct 5 & 7
<b>Week 8:</b> Chapter 7- Processing of Consumed Energy <i>(Chapter 7 outline due October 12)</i>	Oct 12 & 14
<b>Week 9:</b> Mid-term Exam and Field Trip to Cedar Key	Oct 19 & 21
<b>Week 10:</b> Chapter 8- Trophic Structure – Benthic Food Webs <i>(Chapter 8 outline due October 26)</i>	Oct 26 & 28
<b>Week 11:</b> Chapter 9- Trophic Structure – Pelagic Food Webs <i>(Chapter 9 outline due November 2; Weeks 9/10 Question due Nov 2)</i>	Nov 2 <sup>a</sup>
<b>Week 12:</b> Chapter 11- Spatial Structure: Patchiness <i>(Chapter 11 outline due November 9)</i>	Nov 9 <sup>b</sup>
<b>Week 13:</b> Chapter 12- Development of Structure: Colonization and Succession <i>(Chapter 12 outline due November 16; Weeks 11/12 Question due Nov 18)</i>	Nov 16 & 18
<b>Week 14:</b> Biological Invasions	Nov 23
<b>Week 15:</b> Climate Change, conservation, and Marine Ecosystems	Nov 30 & Dec 2
<b>Week 16:</b> Role of Disease in Marine Ecosystems	Dec 7
<b>Week 17:</b> Final Exam	TBD

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<sup>a</sup> No class November 4<sup>th</sup> (Homecoming)

<sup>b</sup> No class November 11<sup>th</sup> (Veteran's Day)

<sup>c</sup> No class November 25<sup>th</sup> (Thanksgiving)

## Additional References

### Web Sites :

Growth, competition, and predator-prey models  
<http://www.blackwellpublishing.com/townsend/models/index.html>

### Other literature sources:

Web of Knowledge  
[http://apps.isiknowledge.com/UA\\_GeneralSearch\\_input.do?product=UA&search\\_mode=GeneralSearch&SID=4C5mNGg@8e3@GGm611N&preferencesSaved=](http://apps.isiknowledge.com/UA_GeneralSearch_input.do?product=UA&search_mode=GeneralSearch&SID=4C5mNGg@8e3@GGm611N&preferencesSaved=)

Townsend CR, Begon M, Harper JL (2003) Essentials of Ecology (2<sup>nd</sup> Edition). Blackwell Publishing, Oxford.

Real LA, Brown JH (1991) Foundations of Ecology. The University of Chicago Press, Chicago.

## Other Information

### Academic Honesty, Software Use, UF Counseling Services, Services for Students with Disabilities

In 1995 the UF student body enacted an [honor code](#) and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

**The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.**

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

*(Source: 2010-2011 Undergraduate Catalog)*

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

This policy will be vigorously upheld at all times in this course.

### **Software Use:**

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

### **Campus Helping Resources**

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)*

Counseling Services

Groups and Workshops

Outreach and Consultation

Self-Help Library

Training Programs

Community Provider Database

- *Career Resource Center, First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://www.crc.ufl.edu/)*

### **Students with Disabilities**

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)