Ecology of Marine Organisms - Course Outline Fall 2015

One definition of ecology is “the study of the abundance and distribution of organisms.” In this course we will explore the physical and the biological features and interactions that determine these abundances and distributions in marine environments. Our investigation of the ecology of marine organisms will include microbes, “plants” (including algae), invertebrate and vertebrate animals.

COURSE CREDIT: 4 credit hours

COURSE FORMAT: lecture, discussion and lab


Additional useful references:

GRADE DETERMINATION:

Research success in science (including marine ecology) is largely a function of one’s ability to 1) synthesize existing knowledge and identify new problems and approaches, 2) “do” science, 3) make insightful contributions during group discussions (meetings, panels, etc.), and 4) write effective grant proposals. This course is designed to foster these abilities.

Distribution of points:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 exams</td>
<td>35 pts</td>
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<tr>
<td>discussion/participation</td>
<td>15 pts</td>
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<tr>
<td>laboratory write-ups</td>
<td>25 pts</td>
</tr>
<tr>
<td>research proposal (NSF format)</td>
<td>25 pts</td>
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<td>100 pts</td>
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</table>

Exams: Two exams, a mid-term and final, will count for 15 and 20% of your grade, resp. The final exam will be cumulative. I will attempt to highlight the most important principles through lecture and lab. You are, however, responsible for all material in assigned readings.

Proposal: Twenty-five percent of your final grade will be based on a research proposal that you will write, using NSF guidelines (see www.nsf.gov). Handouts regarding this format and example proposals will be made available. Proposals should be written on a current topic in marine ecology of your choosing, but must be cleared with me. It can not be a proposal to perform work that you have done in the past, or already started here at CofC. Your proposal will be graded using criteria similar to that used by NSF reviewers and panels to evaluate real grant proposals (these guidelines will also be made available). Proposals are due on April 14; they will be re-distributed to fellow classmates for peer review at that time. Reviewed proposals will be due in my mailbox by April 21.
Lab write-ups: Between 4 and 6 (TBD) write-ups of laboratory exercises will be required. These will be short, formal papers, usually done in pairs of students.

Discussion: I anticipate a few class periods in which we will spend a portion of time discussing assigned readings. Ten percent of your grade will be determined by these discussions and your participation (both quality and quantity) in all lectures and labs. Each of you will also either lead one of these discussions or present a ~30 minute lecture (on some marine or estuarine habitat). This will account for 5% of your final grade.

Grading Scale:

- A: 90+
- B+: 85-89
- B: 80-84
- C+: 75-79
- C: 70-74
- F: 0-69 failing

OFFICE HOURS:

In general, I’ll be around Grice (#104 or #205) and available when needed. For those sticklers for formality:

Office hours: Tues. noon - 2:00
Fri. 11:00 - noon, or by appt.

Phone (at Grice lab): 953-9187; e-mail: plantec@cofc.edu

College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php
# Lecture Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tbody>
<tr>
<td>26 Aug</td>
<td>I. Course Introduction</td>
<td></td>
</tr>
<tr>
<td>31 Aug</td>
<td>II. The Physical Environment &amp; Adaptation</td>
<td>BBSS ch. 1 &amp; 2</td>
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<td></td>
<td>III. The Players</td>
<td></td>
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<tr>
<td>2 Sept</td>
<td>A. Producers</td>
<td>BBSS ch. 16</td>
</tr>
<tr>
<td>7 Sept</td>
<td>B. Consumers</td>
<td>SR</td>
</tr>
<tr>
<td>9 Sept</td>
<td>IV. Basic Biological Considerations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Mass &amp; Energy Acquisition I</td>
<td>SR</td>
</tr>
<tr>
<td>14 Sept</td>
<td>B. Mass &amp; Energy Acquisition II</td>
<td>SR</td>
</tr>
<tr>
<td>16 Sept</td>
<td>C. Reproduction &amp; Dispersal</td>
<td>SR</td>
</tr>
<tr>
<td>21 Sept</td>
<td>V. Population Ecology</td>
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<tr>
<td></td>
<td>A. Population Growth Models</td>
<td>G chap. 1 &amp; 2</td>
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<tr>
<td>23 Sept</td>
<td>B. Age Structure &amp; Growth</td>
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<tr>
<td>28 Sept</td>
<td>Age Structure &amp; Growth II</td>
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<tr>
<td>30 Sept</td>
<td><strong>MIDTERM EXAM</strong></td>
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<tr>
<td>5 Oct</td>
<td>VI. Community Ecology</td>
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<tr>
<td>7 Oct</td>
<td>A. Recruitment</td>
<td>BBSS ch. 4</td>
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<tr>
<td>12 Oct</td>
<td>B. Competition I</td>
<td>G chap. 5</td>
</tr>
<tr>
<td>14 Oct</td>
<td>C. Competition II</td>
<td>SR</td>
</tr>
<tr>
<td>17-20 Oct</td>
<td><strong>Fall Break</strong></td>
<td></td>
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<tr>
<td>21 Oct</td>
<td>D. Predation I</td>
<td></td>
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<tr>
<td>26 Oct</td>
<td>E. Predation II</td>
<td>BBSS ch. 5</td>
</tr>
<tr>
<td>28 Oct</td>
<td>F. Mutualism/Facilitation</td>
<td>BBSS ch. 3</td>
</tr>
<tr>
<td>28 Oct</td>
<td>G. Disturbance &amp; Succession</td>
<td>G chap. 8</td>
</tr>
<tr>
<td>2 Nov</td>
<td>H. Community Structure</td>
<td></td>
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<tr>
<td>4 Nov</td>
<td>Community Structure II</td>
<td></td>
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<tr>
<td>9 Nov</td>
<td>VII. Ecosystems</td>
<td></td>
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<tr>
<td>11 Nov</td>
<td>A. Pelagia</td>
<td>BBSS ch. 15</td>
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<tr>
<td>16 Nov</td>
<td>B. Rocky Shores, Kelp Forests</td>
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<td></td>
<td>C. Coral Reefs, Mangrove &amp; Sea Grass Meadows</td>
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<tr>
<td>18 Nov</td>
<td>D. Soft Bottoms, Salt Marshes</td>
<td></td>
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<tr>
<td>23 Nov</td>
<td>E. Deep Sea &amp; TBD</td>
<td>BBSS ch. 10, 11</td>
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<tr>
<td>25-29 Nov</td>
<td><strong>Thanksgiving Holiday</strong></td>
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<tr>
<td>30 Nov</td>
<td>IX. Intro. to Fisheries Ecology</td>
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<tr>
<td>2 Dec</td>
<td>X. Ecosystem Energetics</td>
<td>TBD</td>
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<tr>
<td>7 Dec</td>
<td>XI. Anthropogenic Influences &amp; Marine Reserves</td>
<td>BBSS ch. 20, 21</td>
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<tr>
<td>11 Dec</td>
<td><strong>FINAL EXAM</strong></td>
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</table>

BBSS = Bertness et al. 2014; G = Gotelli 2008; SR = supplemental reading

Schedule is tentative -- expect revisions.
**Laboratory Schedule**

Labs are scheduled for M and T (2-5 PM) in GML 101 or 202. The laboratory will be a combination of natural history, laboratory & field experiments, and a research proposal. I will try to warn you of special clothes or other items needed for a particular lab but **you are expected to use common sense in deciding what to wear and what to bring** (e.g., an umbrella, boots, sunscreen, bug dope, etc.).

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>*1</td>
<td>31 Aug, 1 Sept</td>
<td>Macrofauna of sediments</td>
</tr>
<tr>
<td>2</td>
<td>7, 8 Sept</td>
<td>Benthic sample processing</td>
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<tr>
<td>3</td>
<td>14, 15 Sept</td>
<td>Plankton</td>
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<tr>
<td>4</td>
<td>21, 22 Sept</td>
<td>Marine Microbiology: some basics</td>
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<tr>
<td>*5</td>
<td>28, 29 Sept</td>
<td>Shorebird behavior</td>
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<tr>
<td>*6</td>
<td>5, 6 Oct</td>
<td>Discussion, sampling lab prep</td>
</tr>
<tr>
<td>7</td>
<td>12, 13 Oct</td>
<td>Sampling lab (<em>I. obsoleta</em> abundance)</td>
</tr>
<tr>
<td></td>
<td>19, 20 Oct</td>
<td>Fall Break</td>
</tr>
<tr>
<td>*8</td>
<td>26, 27 Oct</td>
<td>Competition I</td>
</tr>
<tr>
<td>*9</td>
<td>2, 3 Nov</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>*10</td>
<td>9, 10 Nov</td>
<td>Predation I</td>
</tr>
<tr>
<td>11</td>
<td>16, 17 Nov</td>
<td>Predation II</td>
</tr>
<tr>
<td>12</td>
<td>23, 24 Nov</td>
<td>TBD</td>
</tr>
<tr>
<td>13</td>
<td>30 Nov</td>
<td>(*Fish) Life History</td>
</tr>
</tbody>
</table>

**Proposal subject idea due**

*8 (potential) lab write-ups associated with this lab

**NOTE:** All lab write-ups are due at the beginning of class on the instructor’s due date.