Fall 2014:  MAR662: Physical-Biological Interactions in the Oceans

Instructor: Dr. James J. Bisagni

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3 Credits

Prerequisites:
MAR555/PHY550 or equivalent or permission of instructor

Times:
Tues-Thurs, 1:00-2:15PM

Prof. Bisagni Office Hours:
Tuesday & Thursday, 12:00-1:00 PM & By Appointment

Textbook:
“Dynamics of Marine Ecosystems”
Third Edition
K. H. Mann & J. R. N. Lazier
Blackwell Publishing, 2006
496pp.
# MAR 662 Weekly Class Schedule

<table>
<thead>
<tr>
<th>Week of (#)</th>
<th>Class Topics, Reading Pages</th>
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<tbody>
<tr>
<td>01-SEP (1)</td>
<td>Introduction (1 Lecture) M&amp;L 1-6</td>
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<tr>
<td>08-SEP (2)</td>
<td>Friction &amp; turbulence (1 Lecture) Small-scale phytoplankton physics (1 Lecture) M&amp;L 10-24; M&amp;L 25-42</td>
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<tr>
<td>15-SEP (3)</td>
<td>Small-scale zooplankton &amp; ichthyoplankton physics (1 Lecture) Open ocean vertical structure, biology and Sverdrup theory (1st of 2 Lectures) M&amp;L 42-53, 58-67; M&amp;L 69-89;</td>
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<tr>
<td>22-SEP (4)</td>
<td>Open ocean vertical structure, biology and Sverdrup theory (2nd of 2 Lectures) Phytoplankton blooms and Oceanic Regions (1 Lecture) M&amp;L 89-104; M&amp;L 104-117</td>
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<tr>
<td>6-OCT (6)</td>
<td>Tidal fronts, mixing &amp; plankton (1 Lecture) River plumes &amp; coastal currents (1 Lecture) M&amp;L 136-142; M&amp;L 142-161</td>
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<td>13-OCT (7)</td>
<td>Ekman dynamics &amp; upwelling (1 Lecture) Upwelling Systems I (1 Lecture) M&amp;L 166-178; M&amp;L 178-194 Thursday, 16 October, Handout take-home mid-term exam</td>
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<td>20-OCT (8)</td>
<td>Discuss mid-term exam (1 Lecture) Upwelling Systems II (1 Lecture) M&amp;L 194-215</td>
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<tr>
<td>27-OCT (9)</td>
<td>Tidal mixing fronts: Physics (1 Lecture) Thursday, 30 October class cancelled (Prof. Bisagni at MABPOM Meeting) M&amp;L 216-225</td>
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<tr>
<td>3-NOV (10)</td>
<td>Coastal Fronts &amp; Biology (1 Lecture) Open Ocean &amp; Shelf Fronts (1 Lecture) M&amp;L 225-233; M&amp;L 223-233</td>
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<tr>
<td>10-NOV (11)</td>
<td>Georges Bank, Shelf Break, and Estuarine Fronts &amp; Biology (1 Lecture) Tidal Physics &amp; Associated Effects I (1 Lecture) M&amp;L 233-253; M&amp;L 254-270</td>
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<tr>
<td>17-NOV (12)</td>
<td>Tidal Physics &amp; Associated Effects II (1 Lecture) Wind-driven and Thermohaline Circulation (1 Lecture) M&amp;L 270-284; M&amp;L 288-307</td>
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<tr>
<td>24-NOV (13)</td>
<td>Western Boundary Currents, Oceanic Gyres &amp; Biology (1 Lecture) Thursday, 27 November class cancelled (Thanksgiving recess) M&amp;L 307-336</td>
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<tr>
<td>01-DEC (14)</td>
<td>Ocean Circulation Variability: Pacific &amp; Atlantic (1 Lecture) Ocean Circulation Variability: Fisheries Case Study (1 Lecture) M&amp;L 337-381; Handout: Marsh et al. 1999 Paper <em><strong>Last class, Thursday, 4 December; Term papers due</strong></em> Handout take-home final exam</td>
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Focus:

This course will cover many of the fundamental principles relating physical oceanographic processes to the biology of the ocean on a variety of spatial and temporal scales ranging from turbulence to gyre scales. The course will be conducted using class lectures and assigned readings from a textbook and possibly a short reading list from various oceanographic journals.

What is expected:

Students taking the course for credit will:

1) attend class and complete all reading assignments,
2) understand the important aspects of each assigned reading,
3) complete take-home mid-term and final examinations,
4) submit a completed term paper on an approved topic to me on or before the last day of class

Term Papers:

A term paper will be a scholarly piece of work which either:

1) discusses some aspect of physical-biological interactions in the ocean via a literature search, or
2) attempts to pose and then answer some research question using data which are available in the literature or on-line.
3) term papers will not include any plagiarized material from the Web or other sources
4) term papers will contain full attribution of cited previous work completed by others.

All term papers will be typewritten (15-page maximum of double-spaced text, not including bibliography or figures/tables, hard-copy only please!) and include:

1) Title
2) Abstract
3) Body (Introduction and Discussion)
4) Conclusions
5) Bibliography  (Follow a standard format used by a real journal, your choice!)
6) Pagination
Grading:

Final grades will be based on:

1) Mid-term exam 30%
2) Final exam 30%
3) Paper/Project 40%