BIOLOGY OF MARINE ORGANISMS
BIOLOGY F328
34622-F01S-2002

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Phone: 474-6295

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Bunn. 312
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HANDOUTS (HO): Free
LECTURE: 9:45-11:15 a.m. (as arranged) T & Th, 409 Bunnell
(w/Notes) Meets ORAL INTENSIVE communication requirement

PREREQUISITES: Upper division standing in a scientifically oriented major
Biol. 105/106 knowledge level is assumed.

COURSE DESCRIPTION:

Marine Biology is designed to provide an in-depth INTRODUCTION to the field of Marine
Biology, in the broad sense, for the mid-level undergraduate student with interests in marine
biological and oceanographic sciences. Assumed is a minimum background in basic chemical,
physical, and biological sciences, but certainly no more than would be obtained from introductory
‘100’ level courses. Familiarity with the major invertebrate phyla would be helpful, but not
necessary. Some acquaintance with basic ecological concepts will also be helpful but, if lacking,
may be obtained from primary and supplemental readings in ecology.

Our focus will place emphasis on those ECOLOGICAL PROCESSES and
ADAPTATIONS that act to structure marine associations, ocean habitat, distribution,
classification, and functional morphology of organisms that permit their persistence through time.
The course will not become a guided tour down the garden path toward knowing our Alaskan flora
and fauna, necessarily. Where appropriate, information and data pertinent to Alaska will be
provided. Unfortunately, the construct of our course, the relative proximity to marine systems, and
the time of year, simply do not lend themselves to a strong field or laboratory orientation. The 90-
min. class meeting times will allow for the use of traditional lectures supplemented with
audiovisuals such as 35 mm color slides, VHS videos, occasional films, abundant overhead
projections, preserved specimens, and ‘thematic labs’ (e.g., larvae, animal phyla, marine algae),
and project oriented "laboratories". It is the intent of this instructor to duplicate our formal NOTE
set for distribution and use during class discussions. Therefore, a 3-ringed notebook will be
needed to contain myriad handouts in an organized manner.

You will be given ample opportunity to “search the literature” through supplemental
READINGS, to make CRITIQUES from marine literature on subjects of interest (see the potential
descriptive subject listing) through library literature sources, to write by developing an ABSTRACT
on a literature research project of interest, and preparing that information for dissemination to the
class in an **oral presentation** made at the 8th MARINE BIOLOGY COLLOQUIUM to be conducted at the end of our course. (See Lect. Sched. for dates)

**GRADING:**

Earned grades will be based on total points (ca. 575) received from THREE lecture EXAMS, Five SCIENTIFIC PAPER CRITIQUES, the ABSTRACT and PRESENTATION for our end of semester *Eight Marine Biology Colloquium*.

**Total points** earned will conform to an ADJUSTED POINT TOTAL (APT = curved point total) that equals one half the difference between *my* TOTAL POINTS POSSIBLE and *your* highest TOTAL NUMBER OF POINTS EARNED in our course. The APT will then be set to the following % scale and superimposed such that:

- A = 92-100 %
- B = 82- 91 %
- C = 72- 81 %
- D = 65- 71 %
- F = 0- 64 %

Point distributions will be made approximately as follows:

<table>
<thead>
<tr>
<th>POINT</th>
<th>TASK</th>
<th>CHAPTERS</th>
<th>DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Sci. Paper Critique 1</td>
<td></td>
<td>Jan. 29</td>
</tr>
<tr>
<td>25</td>
<td>Sci. Paper Critique 2</td>
<td></td>
<td>Feb.  5</td>
</tr>
<tr>
<td>125</td>
<td>Lecture Exam 1</td>
<td>1,2,P,D &amp; Zooplankton</td>
<td>Feb. 12</td>
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<tr>
<td>25</td>
<td>Sci. Paper Critique 3</td>
<td></td>
<td>Feb. 19</td>
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<tr>
<td>25</td>
<td>Sci. Paper Critique 4</td>
<td></td>
<td>Feb. 26</td>
</tr>
<tr>
<td>125</td>
<td>Lecture Exam 2</td>
<td>4,3,5,7,9 &amp; Phytoplankton</td>
<td>Mar. 14</td>
</tr>
<tr>
<td>25</td>
<td>Sci. Paper Critique 5</td>
<td></td>
<td>Apr.  2</td>
</tr>
<tr>
<td>25</td>
<td>Colloquium Abstracts Due</td>
<td></td>
<td>Apr. 9 &amp; 11</td>
</tr>
<tr>
<td>125</td>
<td>Lecture Exam 3</td>
<td>6,8,10, &amp; 11 &amp;</td>
<td>Apr. 18</td>
</tr>
<tr>
<td>50</td>
<td>Colloquium Presentations</td>
<td></td>
<td>Apr. 23,25,30 &amp; May 2</td>
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**575 TOTAL COURSE POINTS**

This instructor also reserves the right to include subjective “human element” considerations in determining FINAL course grades; i.e., class attendance, improvement(s), extenuating and/or unforeseen circumstances, illness, motivation, effort, participation, and the general level of enthusiasm, to which points will NOT nor can they be assigned but can indirectly affect the outcome of SEMESTER grades very dramatically. Platonic discourse and questioning strategies are used such that this class will be discusstonal! KEEP UP WITH THE READINGS!
**Biology Of Marine Organisms**

**Lecture & Laboratory Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic of Discussion</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 17 R</td>
<td><strong>First Day of Instruction:</strong> Late registration &amp; Financial aid begin  &lt;br&gt; Lecture:  &lt;br&gt; <strong>Introduction to the Marine Environment</strong>  &lt;br&gt; Syllabus  &lt;br&gt; Marine Biology Colloquium  &lt;br&gt; The Scientific Paper Critique &amp; Topics  &lt;br&gt; Personal Data Card  &lt;br&gt; <strong>The Marine Environment</strong>  &lt;br&gt; Divisions of the Marine Environment  &lt;br&gt; Properties of Water  &lt;br&gt; Basic Oceanography  &lt;br&gt; <strong>View Video #1:</strong> Miracle Planet  &lt;br&gt; (Check out for Home viewing)</td>
<td>Read Ch. 1</td>
</tr>
<tr>
<td>Jan 21 M</td>
<td>Alaska Civil Rights Day</td>
<td>No class</td>
</tr>
<tr>
<td>Jan 22 T</td>
<td><strong>Lecture:</strong>  &lt;br&gt; <strong>The Marine Environment</strong>  &lt;br&gt; Ecological Principles  &lt;br&gt; Larvae and Larval Ecology  &lt;br&gt; Comparisons of Terrestrial and Marine Ecosystems</td>
<td>Ch. 1</td>
</tr>
<tr>
<td>Jan 24 R</td>
<td><strong>Lecture/Laboratory:</strong>  &lt;br&gt; <strong>Marine Animal Phyla</strong>—The “Colonial Protists” &amp; Protostomes  &lt;br&gt; <strong>View Video #2:</strong> In Search of the Giant Squid  &lt;br&gt; (Check out for Home viewing)</td>
<td><strong>Meets in Rm. 316</strong></td>
</tr>
<tr>
<td>Jan 25 F</td>
<td>Last day for late registration and fee payment and Last day for student/faculty initiated withdrawals and 50% tuition refunds</td>
<td></td>
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<tr>
<td>Jan 29 T</td>
<td><strong>Lecture/Laboratory:</strong>  &lt;br&gt; <strong>Marine Animal Phyla</strong>—The Deuterostomes  &lt;br&gt; <strong>Scientific Paper Critique #1</strong>  &lt;br&gt; <strong>View Video #7:</strong> Cephalopods: Incredible Suckers  &lt;br&gt; (Check out for Home viewing)</td>
<td><strong>Meets in Rm. 316</strong>  &lt;br&gt; <strong>Due</strong></td>
</tr>
<tr>
<td>Jan 31 R</td>
<td><strong>Lecture:</strong>  &lt;br&gt; Plankton and Plankton Communities  &lt;br&gt; Phyto- and Zooplankton  &lt;br&gt; Floatation Mechanisms  &lt;br&gt; <strong>View Video #3:</strong> Season in the Sea  &lt;br&gt; (Check out for Home viewing)</td>
<td>Read Ch. 2</td>
</tr>
</tbody>
</table>
FEB 5 T  LECTURE:

**Plankton and Plankton Communities**
Primary Productivity of the Biosphere
Factors Affecting Primary Production
The Ocean Ecosystem:
The Classic Model & A Changing Model

**SCIENTIFIC PAPER CRITIQUE 2**
LECTURE/LABORATORY EXAM 1 Review Sheet

Ch. 2
DUE

FEB 7 R  LECTURE/LABORATORY:

**ZOOPlankton:** The Micro Invertebrates
(Animalia Larvae)

Meets in Rm. 316

FEB 12 T  LECTURE/LABORATORY EXAM 1

Chpts 1 & 2, the
Protostomes, Deuterostomes,
and ZOOPlankton (Larvae)

FEB 14 R  LECTURE/LABORATORY:

**PHYTOplankton:** The Micro- and Macro- Algae
(Protista & Plantae)

Meets in Rm. 316

FEB 15 F  LAST DAY TO APPLY FOR SPRING GRADUATION

FEB 19 T  LECTURE:

**Deep-Sea Biology**
Zonation
Sampling the Deep Sea
Environmental Characteristics

**SCIENTIFIC PAPER CRITIQUE 3**

DUE

FEB 21 R  LECTURE:

Adaptations of Deep-Sea Organisms
Community Ecology of the Benthos
Mid-water Community Ecology

**VIEW VIDEO #4: Deep Sea**
(Check out for Home viewing)

FEB 22 F  *Low grade reports for Freshman due!*

FEB 26 T  LECTURE:

**Oceanic Nekton**
Adaptations of Oceanic Nekton
Ecology of Nekton

**SCIENTIFIC PAPER CRITIQUE 4**

DUE

FEB 28 R  LECTURE:

**Shallow-Water Subtidal Benthic Associations**
Environmental Conditions
Unvegetated Sedimentary Environments
Rocky Subtidal Communities

Read Ch. 5
MAR 5 T LECTURE:  
Kelp Beds and Forests  
Seagrass Communities  
Special Communities  
Scientific Paper Critique 5  
LECTURE/LABORATORY EXAM 2 Review Sheet  
DUE  
Ch. 5

MAR 7 R LECTURE:  
Meiofauna  
Environmental Characteristics, Adaptations & Ecology  
Composition of Interstitial Assemblages  
Sampling and Extracting  
Read Ch. 7

MAR 12 T LECTURE:  
Tropical Communities  
Coral Reefs  
VIEW VIDEO #5: Under the Emerald Sea  
( Check out for Home viewing )  
Read Ch. 9

MAR 14 R Last day for Student/Faculty initiated withdrawals with "W" grade  
LECTURE/LABORATORY EXAM 2  
Chpts 4, 3, 5, 7, & PHYTOplankton (Algae)

MAR 18-24 SPRING BREAK

MAR 26 T LECTURE:  
Coral Reefs cont.  
Mangrove Forests  
VIEW VIDEO #6: Treasures of the Great Barrier Reef  
( Check out for Home viewing )  
Read Ch. 6

MAR 28 R LECTURE:  
Intertidal Ecology  
Environmental Conditions  
Adaptations of Intertidal Organisms  
Read Ch. 6

APR 2 T LECTURE:  
Rocky Shores  
Sandy Shores  
Muddy Shores  
COLLOQUIUM TIME SLOT  
SIGN UPS

APR 4 R Registration for Fall semester 2000 begins

APR 8 M LECTURE:  
Estuaries and Salt Marshes  
Types of Estuaries  
Physical Characteristics  
Biota of Estuaries  
Read Ch. 8

APR 9 T LECTURE:  
Adaptations of Estuarine Organisms  
Ecology of Estuaries  
Salt Marshes  
COLLOQUIUM ABSTRACT DUE  
FOR EC!
APR 11 R  LECTURE:
  
  **Symbiotic Relationships**
  Symbioses of Algae and Animals
  Symbioses Among Animals
  
  **Colloquium Abstract Due**

  LECTURE/LABORATORY EXAM 3 Review Sheet

  **Drop Dead Date**
  HO

  Read Ch. 10

APR 16 T  LECTURE:
  **Human Impact on the Sea**
  Fisheries
  Mariculture
  Pollution
  Drugs from the Sea
  Global Warming and Sea Level

  Read Ch. 11

APR 18 R  **LECTURE EXAM 3 (our “final”)**

APR 23 T  8th MARINE BIOLOGY COLLOQUIUM 10 min. student presentations

APR 25 R  8th MARINE BIOLOGY COLLOQUIUM 10 min. student presentations

APR 26 F  *All Campus Day, No Classes*

APR 30 T  8th MARINE BIOLOGY COLLOQUIUM 10 min. student presentations

MAY 2 R  8th MARINE BIOLOGY COLLOQUIUM 10 min. student presentations

MAY 8-11  **FINALS 8**

MAY 12 S  **COMMENCEMENT**

VIDEOS: View at your own discretion, in the lab. or check out for take-home viewing in the comfort of your own dwelling. See suggested Syllabus viewing dates blocks.

Don’t forget the popcorn!

1. Miracle Planet
2. In Search of the Giant Squid
3. Season in the Sea
4. Deep Sea
5. Under the Emerald Sea
6. Treasures of the Great Barrier Reef
7. Cephalopods: Incredible Suckers