



Oregon State University

Ecampus

Course Name: Marine Biology and Ecology

Course Number: BI 450

Credits: 15 Credits

Location

Hatfield Marine Science Center, Education Building, Lecture room 30/32, Lab room 31.

Course Credits

Bi 450 is a 16 credit course devoted to classroom, laboratory, and field work. On average, the students spend 30 hours per week on classroom, laboratory, and fieldwork instruction and assignments, resulting in 300 hours of instruction for 15 credits.

Required Texts

Textbook:

Lamb, A. and B. P. Hanby. 2005. *Marine Life of the Pacific Northwest*. Harbour Publishing Company, Madeira Park, BC Canada.

One fish field guide of your choice:

Miller, D.J. and Lea, R.N. 1972. *Guide to the Coastal Marine Fishes of California*. Fish Bulletin 157. California Dept. of Fish & Game.

Eschmeyer and Herald. 1983. *Field Guide to Pacific Coast Fishes of North America: From the Gulf of Alaska to Baja California* (The Peterson Field Guide series). Houghton Mifflin.

One algae field guide of your choice:

Druehl, Louis D. 2000. *Pacific Seaweeds: A Guide to Common Seaweeds of the West Coast*. Harbour Publishing, Madeira Park, BC Canada.

Mondragon, Jennifer & Mondragon, Jeff. 2003. *Seaweeds of the Pacific Coast: Common Marine Algae from Alaska to Baja California*. Sea Challengers, Monterey, CA.

Algae "e-packet":

Download lab manual and reference materials to use on-screen or print as needed.

Optional Guides:

Sheldon, I. 1998. *Seashores of the Pacific Northwest*. Lone Pine Publishing, Portland, OR.
Mac's Field Guide to the Northwest Coastal Invertebrates. Mac's (Laminated) Field Guides, The Mountaineers, Seattle, WA.

Laminated Field Guide to Algae. LEP / WSU Beach Watchers, Coupeville, WA website:

http://www.beachwatchers.wsu.edu/ezydweb/ID_sw_cards/index.htm

Humann, Hall, and McDaniel. 1996. *Coastal Fish Identification: California to Alaska*. New World Publications.

Lamb and Edgell 2010. *Coastal Fishes of the Pacific Northwest*. Harbour Publishing, Canada. (revised and expanded 2nd edition.)

Love. 1996. *Probably More Than You Want to Know About the Fishes of the Pacific Coast, 2nd Ed.* Really Big Press.

Course Description and Outcomes

Subject Matter and Format:

Marine Biology (BI 450) is an intensive, term-long course based at Hatfield Marine Science Center (HMSC). The prerequisite for the course is Bi 370 or equivalent. The course is divided into 6 topics or sections that include:

- 1) Natural history of the Oregon coast and marine invertebrate biology and natural history,
- 2) Marine fish biology and natural history
- 3) Marine algae and natural history
- 4) Marine community ecology
- 5) Marine conservation and policy
- 6) Small group research projects

The material is presented in a variety of ways including lectures, discussions, laboratory work, and field trips. The final 2-3 weeks is devoted to conducting small group research projects. This is a Writing Intensive Course (WIC) and there are a number of formal and informal writing assignments (see below).

Learning Outcomes:

Student goals or outcomes include the ability to **comprehend, interpret**, and subsequently **synthesize** information on the topics described above.

Students will learn to **conduct** a research project from start to finish including writing a research proposal, designing and executing an experiment, collecting, analyzing, and graphing data, writing a scientific research paper (~4,000 words), and giving a scientific talk.

Specific WIC outcomes include:

- 1) Develop and articulate content knowledge and critical thinking in biology through frequent practice of informal and formal writing.
- 2) Demonstrate knowledge and understanding of audience expectations, genres, and conventions appropriate to communicating in biology.
- 3) Demonstrate the ability to compose a document of at least 2,000 words through multiple aspects of writing, including brainstorming, drafting, using sources appropriately, and revising comprehensively after receiving feedback on a draft.

Student Expectations and Assessment

Grades:

Grades will be based on 100 points received each week of the course with a total of 1000 points possible. Points will be distributed in the following way: Marine Invertebrates–200 pts, Marine Fishes–150 pts, Marine Algae–150 pts, Marine Community Ecology–200 pts, Marine Conservation–100 pts, Research Projects–200 pts. Points within each section will be distributed based on each instructor's discretion but will include lecture and laboratory exams, reading discussions, writing assignments, and class participation. Most sections involve an exam and/or paper at the end. The last day of class is the Friday before finals week and there is no final exam. **IMPORTANT NOTE: ALL ASPECTS OF THE COURSE ARE REQUIRED. FAILURE TO PARTICIPATE WITHOUT BEING EXCUSED BY THE INSTRUCTOR WILL RESULT IN A PENALTY.**

Research Projects:

Research projects will be conducted mostly during the last 2-3 weeks of the course under the supervision of Drs. Henkel and Hacker and the teaching assistants. Students will work in groups of 3 people or fewer and be solely responsible for the design, implementation, analysis, and presentation of their research project, both as a seminar and written paper. The project should be a total group effort with the exception of the research paper, which will be written by each student individually. These papers will be gathered together in one published volume that will be kept at the library for view by others. In addition, we will host a research symposium where groups will present their research to the class and other invited scientists.

Blog:

We will maintain a course blog over the term. A different group of ~2 students will make entries to the blog each week (and be graded for their work). The blog should document what happened in the course each week, what memorable species or habitats were seen, and contain a few good photos taken by the group or others in the class. We will give you an additional handout describing the blog in more detail.

Writing Intensive Course Assignments:

As a WIC, this course has a significant writing component aimed to 1) help students better learn the course material through writing, 2) help students to become better writers, and 3) help students better learn the kinds of writing important to the scientific profession in which they are entering. There are a number of writing assignments in the individual sections all of which culminate in a final research paper based on the small group research projects described above. The writing assignments are designed to help with writing the final research paper, as well as exposing students to formal and informal types of scientific writing used in the profession. The writing assignments will result in more than 10,000 words of writing and make up roughly 400 pts or 40% of the overall grade for the course.

Below is a list and brief description of the writing assignments in the course. The instructor of each section will provide further instructions for these writing assignments.

1) Marine Invertebrate Biology and Natural History.

- Favorite Marine Invertebrate Paper (~500 words): This is a one-page paper designed to help with writing a formal introduction to a scientific paper. The assignment includes creating an annotated bibliography (15 pts).
- Laboratory Notebooks (~750 words): These notebooks include drawings and written descriptions of marine invertebrate organisms. This writing assignment is designed to hone scientific observation skills (50 pts).
- Blog (~1,000 words): An electronic journal (blog) is maintained throughout the course. This

assignment helps with informal descriptive and narrative writing skills (20 pts).

2) *Marine Fish Biology and Natural History:*

- Fish Field Report (~750 words): This short paper helps students with hypothesis testing, scientific data presentation, and reporting on results from fish surveys (25 pts).
- Laboratory and Field Notebooks (~750 words): These notebooks include drawings and written descriptions of fishes found in the field or examined in the laboratory. This writing assignment is designed to hone scientific observation skills (25 pts).

3) *Marine Algae and Natural History:*

- Specimen Information Cards (~750 words): These cards are used to help identify algae and will be used in student group demonstrations. Development of the cards requires students to describe in a concise written manner the important characteristics of algae for use by others (25 pts).

4) *Marine Community Ecology:*

- Community Structure Field Report (~750 words): This short paper helps students with hypothesis testing, scientific data presentation, and reporting on results from community structure surveys (50 pts).

5) *Marine Conservation and Policy:*

“Op-Ed” Newspaper Article (~750 words): This short article helps students learn one way for which scientist can voice their opinion to the public about timely topics. The assignment includes creating an annotated bibliography (40 pts).

6) *Small Group Research Projects:*

- Research Project Proposal (~1,000 words): This is a short 3-page formal proposal that describes the research to be conducted. Please see the projects instructions for details (50 pts).
- Final Research Paper (~3,000 words): This is a formal research paper that reports on the results of small group research projects. The paper is in the format of a scientific journal article (100 pts).

Canvas:

We will use the Canvas program available on the OSU website (my.oregonstate.edu/) to post syllabi, lecture notes, presentations, readings, etc.

Books, Lecture Notes, and Lab Notebooks:

There is one required book, Lamb and Hanby (2005). It is a guide to identifying marine organisms (including seaweeds) and will be used throughout the course but especially during the invertebrate biology section. You will also need fish and algae guidebooks to be chosen from the selection above. There are optional field guides for the fish and invertebrate sections; these are durable field books with nice color drawings or laminated cards that can literally be dropped in tidepools. Most instructors will rely heavily on lecture notes that you will need to obtain prior to their section via Canvas (see above). Finally, we will have a number of books available on reserve in the library as well as some additional guidebooks and keys in the laboratory. *You will need ONE plain white paper notebook for drawings of organisms in the lab; heavy drawing paper works best. You will also need a waterproof notebook (such as Rite in the Rain) for fieldwork.*

Research Material:

The Guin Library at HMSC has a number of journals and books that will serve as sources of research material for your papers and research projects. You will tour the library on the first day.

Field Gear and Equipment:

The course is very field trip oriented so you will need proper clothing and equipment for all weather types (e.g., last spring we experienced rain, gale force winds, snow, and 90 deg weather all in 10 weeks!). At minimum, you will need raingear and rubber boots. The following clothing is *recommended* for the field: waders (preferably the neoprene type), fleece coat or warm jacket, long and short pants, long and short sleeved shirt (a couple of layers work well), long underwear, hat, gloves (rubberized garden gloves work well), and thick socks. Additional items include: back pack, magnifying lens, binoculars, head lamp, pocket knife, sunglasses, camera, sunscreen, water bottle, and field guides for identification. Field sampling and experimental equipment are provided by the course.

Acknowledgement of Risk and Waiver of Liability

We require every student to sign an Acknowledgement of Risk and Waiver of Liability form that covers activities that may be incur risk and liability such as field trips. These forms will be filled out on the first day of class.

University and Departmental Policies

Students with Disabilities: "Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098."

Rules on Student Conduct: The Department of Zoology follows the university rules on student conduct. A full account of the conduct code can be found at:

<http://oregonstate.edu/studentconduct/regulations/index.php>.

Below are those sections related to Obstruction and Academic Dishonesty.

A Student or Student Organization found to have committed any of the following proscribed acts is subject to sanctions under these rules:

(1) Obstruction or disruption of teaching, learning, research, administration, disciplinary procedures, or other institutional activities, including the institution's public service functions or other authorized activities on institutionally-owned or controlled property. Disruptive behavior may include but is not limited to the following, where it has the effect of obstructing or disrupting the University activities listed above:

- a) repeatedly leaving and entering the classroom without authorization;
- b) making loud or distracting noises;
- c) arriving late or leaving early;
- d) persisting in speaking without being recognized;
- e) behavior that would cause a reasonable person to fear for his or her safety.

The instructor has authority to manage the classroom environment, which may include requiring a Student to leave when the Student's behavior disrupts the teaching or learning environment. If the Student refuses to leave, the instructor may call the Department of Public Safety for assistance and should submit an Incident Report Form to SCCS to initiate disciplinary proceedings.

(2) Academic or Scholarly Dishonesty:

a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.

- b) It includes: (i) CHEATING - use or attempted use of unauthorized materials, information or study

aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit. (ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references. (iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114). (iv) TAMPERING - altering or interfering with evaluation instruments or documents. (v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

Disclaimer:

The schedule, policies, and assignments in this course are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor and the students.

Student Evaluation of Teaching:

We encourage you to engage in the course evaluation process each term – online, of course. The evaluation form will be available toward the end of each term, and you will be sent instructions through ONID. You will login to “Student Online Services” to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.