

## Course Syllabus: **Marine Ecology**

University of Oregon | Oregon Institute of Marine Biology

Spring 2023 | BI 474 (5 Credits)

Dr. Lisa Munger

**Class room & time:** Marine Birds and Mammals, Fridays from 8 am-3:30 pm (subject to change depending on tides -- see schedule). Dates: April 5 - June 14.

**Instructor:** Dr. Lisa Munger, [lmunger4@uoregon.edu](mailto:lmunger4@uoregon.edu), tel 808-352-0026. Meetings/office hours by appointment. I am based in Eugene most of the week but will usually be at OIMB Thursday afternoon through Saturday morning.

**GE:** Lauren Rice, [lnr@uoregon.edu](mailto:lnr@uoregon.edu), meetings by appointment or can frequently be found in the Young lab at OIMB.

### **REQUIRED MATERIALS:**

#### **Readings:**

- Between Pacific Tides, by Edward F. Ricketts, Jack Calvin, and Joel W. Hedgpeth. (5th edition preferred) - hereafter abbreviated BPT
- Scientific publications, to be posted each week in Canvas

#### **Supplies:**

- iClicker
- Laptop for in-class work with Microsoft Office suite (available via UO, <https://software.uoregon.edu/> )
- Write-in-rain notebook
- Outdoor gear for field trips (rain gear, boots, etc)
- Suggested: waterproof/resistant case for smartphone

#### **Technology/Devices:**

- Canvas: most materials and assignments for the course will be accessible/submitted online via Canvas, unless otherwise specified
- Use of internet-enabled technology (smartphones, tablets, laptops, etc.) is a big part of this course, e.g. to look up information, record and share data, document via photograph/video, etc. Apps and software downloads may also be required for some projects.

## **SUMMARY:**

Marine Ecology is an interdisciplinary field covering the interaction of organisms with each other and their environment. In this course, we approach the discipline by focusing on the strengths of our program's unfettered access to the flora and fauna of the local shore, emphasizing concepts and practice of rocky intertidal community ecology. Each week, we will be in the field, getting wet, making observations, and learning how to link these observations to developing and testing hypotheses that connect to fundamental ecological theory. Students will work on weekly and full-term experiential group projects. The basic ethos of the course is: *doing* marine ecology.

## **LEARNING OBJECTIVES (LOS):**

These are the skills and abilities that we will develop throughout the term, and that you will be asked to demonstrate via short assessments and the term project. In general they fall into three categories:

**Domain knowledge** –in which we build up foundational knowledge of marine ecology concepts, terminology, tools, and core questions, and make interdisciplinary connections that allow us to synthesize, evaluate, hypothesize, predict, etc.

- Describe the natural history of relevant groups of marine organisms—reproduction, growth, feeding, behavior, distribution, etc.
- Explain how marine biological entities (organisms, populations, communities, etc.) interact with physical, chemical, geological, & atmospheric processes over time - through the lens of scale
- Make accurate observations and convey information using scientific terminology
- Construct models of understanding for the particular ecosystems/habitats we are studying, based on empirical evidence
- Apply theoretical concepts from biology and ecology and evaluate how well they fit observations

**Scientific skills** – in which we hone our abilities to carry out all steps of the scientific process and tasks that scientists do on the job.

- Interpret and synthesize scientific literature
- Formulate a research question and design a feasible study to investigate it
- Use proper lab or field equipment & techniques
- Collect data & observations in an organized, meticulous, repeatable fashion
- Analyze data using appropriate quantitative methods
- Create clear and informative graphs, tables, and other data products
- Write scientific articles suitable for publication in a peer-reviewed journal
- Evaluate the work of your peers and provide constructive feedback

**Transferable skills** –in which we develop essential career skills such as collaboration, project management, and problem solving, which will serve you in any field.

- Cultivate an inclusive, safe, and motivational work environment
- Work as a team to manage a project from start to finish—brainstorm ideas, set goals and timelines, solve problems, and produce deliverables you are proud of
- Facilitate productive discussions and meetings
- Synergize the unique skill sets, interests, and perspectives of each person
- Embrace the “negatives” (mistakes, constructive criticism, etc.) as well as the positives—they are all our teachers
- Exercise metacognition—reflect on your own learning and thinking process

### **COURSE FORMAT:**

(underlined terms indicate to be submitted for a grade)

During our Fridays together, expect to have some short lecture(s), lots of discussion of readings and other matters, field trips, in-class activities, software/analysis tutorials, and work time to conduct research, process samples, analyze data etc. Lecture slides will be available as PDFs in Canvas. At the end of each class day, please submit a written exit essay that summarizes what you think are the 3 most important take-aways of the day as well as any questions or unclear points. You will also develop a quiz question (either multiple choice or short essay/sketch), due Wednesday, to be included in the question pool for the following week's quiz, given in class on Friday. (See guidelines for quiz questions, appendix A).

We will follow a similar format for readings throughout the course. Each week we'll read section(s) from BPT (we will jump around) as well as at least one reading from the scientific literature. Readings should be completed before class. For BPT readings, I encourage you to highlight noteworthy passages, and/or bring up questions or points you'd like to discuss. For each scientific reading, I request that you write a 30-words-or-less summary (bring to class and submit to Canvas afterwards), and be prepared to discuss and ask questions.

We will get outside every Friday, rain or shine. I plan for us to conduct research in 3 different types of habitats, which we'll visit a few times each: soft sediments (mud flats and sandy shores), rocky shores, and marsh/slough (see schedule). We will collaborate to come up with research questions and study design. We will all work together to conduct sampling and data analysis for all of the projects/habitats, and by doing so will hopefully add some new field techniques, software and quantitative skills to everyone's tool set. In addition, you will collaborate in small teams (2 or 3) to write a scientific publication for ONE of the projects/habitats, to be submitted to the journal OMEN (our local student journal at OIMB, founded by Dr. Aaron Galloway -- see appendix B for author guidelines). You will submit drafts of the paper, data logs, etc. for feedback, and you will peer review each others' submissions. Finally, on the last day of class, your group will give a 15-minute presentation of your findings.

## GRADING:

There are **100 points** available for you to earn in this course. **1 point = 1 % of your course grade.** Final letter grades will be assigned as follows: A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = 59% or less.

- Term Project = 50 points
  - Drafts = 8
  - Data logs = 8
  - Peer reviews = 8
  - Final paper = 13
  - Final presentation = 13
- Quiz Questions = 15 (due in Canvas on Wednesday)
- Weekly Quizzes = 15 (given in class on Friday)
- Participation = 20
  - Exit Essays – on paper, end of class
  - 30-word summaries - in Canvas, after class
  - Clicker q's – in class
  - Other in-class activities

**Code of Conduct:** We will work together to set course expectations and create an environment that fosters scholarship and integrity. In addition, please take the time to learn about the University of Oregon's policies for student conduct here: <http://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>.

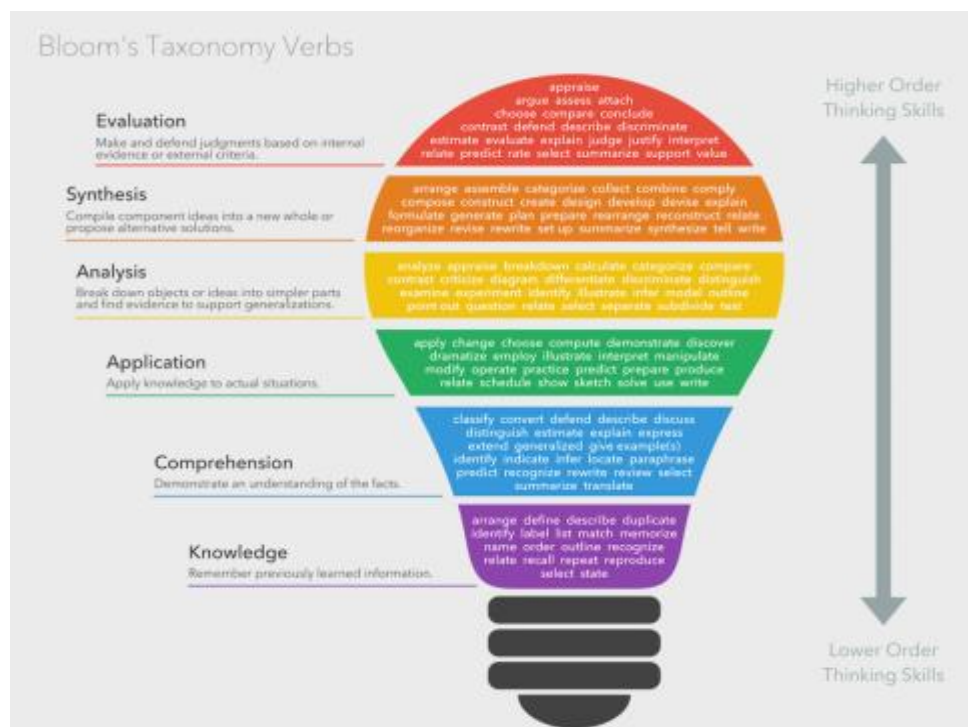
## COURSE SCHEDULE (subject to change)

	Low Tide	Field trip	Reading
5-April	N/A	OIMB beach walk	BPT Prefaces (ix-xxvi), Introduction (1-14), and Part V ch. 11 and 12 up to Microhabitats (427-457)
12-April	0.21' at 12:37 pm Sack lunch	Mudflat – Boat Basin Rd corner	BPT Part III ch. 8: Mud Flats (354-395) ImageJ tutorial- Lauren
19-April	-0.69' at 6:52 am sack breakfast meet at 6	Rocky shore (South or Middle Cove)	BPT Part I ch.1: Outer-Coast Rocky Shores, up to Low Intertidal (17-85) Distance sampling-Lisa
26-April	0.74' at 12:37 pm Sack lunch	Sandy shore – Lighthouse or Sunset?	BPT Part I Ch. 2 Outer-Coast sandy Beaches, 205-210, and Part II Ch 4, Open-Coast Sandy Beaches, 249-265
3-May	N/A sack breakfast	Salt marsh -Metcalf – first thing (meet at 7)	
10-May	-0.62' at 11:11 am Sack lunch	Rocky shore (S or M)	
17-May	N/A	TBD – pier pilings?	
24-May	-0.03' at 10:58 am	Mudflat (Crown Point)	

	Sack lunch	Rd)	
31-May	N/A FT after lunch	Port Orford kayaking trip?? Cape Arago trails? Salt marsh	
7-June	-1.52' at 10:01 am Back by lunch	Rocky shore – Sunset Beach Island	
14-June	N/A	TBD	

## APPENDIX A: Guidelines for quiz questions

- Be at least “comprehension” level (see Bloom's Taxonomy of cognitive processes)
- Multiple choice or short free-form answer (sketch, short essay, make a table, etc)
  - Multiple choice distractors (wrong answers) should be plausible - no jokes or super-obviously wrong answers
- Include a correct/model answer
- Include a rationale or rubric - how would you grade it (if short answer)? What pieces must be there? Why is the correct answer correct, and the others are incorrect (for a multiple choice question)?



## **APPENDIX B - Guidelines for course e-journal: OREGON MARINE ECOLOGY NOTES [OMEN]**

**-Revised by Lisa Munger, April 2019.**

With a mission of cataloging the top research papers from the OIMB annual Marine Ecology course.  
Editor-in-Chief (EIC): Aaron Galloway (agallow3@uoregon.edu)

Acting Editors: Lisa Munger and Lauren Rice.

### **Manuscript Submissions:**

The OMEN e-journal considers pithy research reports that communicate the key findings of research conducted during Marine Ecology. The top ranked term papers that advance through in-class peer review will be published in this class journal. All submissions will also be retained and available to the public at the OIMB library. There is one kind of pre-approved article type:

- **Research Notes:** novel findings from field and laboratory research conducted during the Marine Ecology class at OIMB. Other formats require instructor pre-approval.

### **Guidelines for Authors:**

- 1) The final paper and data submission must be delivered to Canvas by the published deadline (TBD)
- 2) Text of submissions should be approx. 2000 words and contain a minimum of 2 and maximum of 4 tables and/or figures. Word count applies to article body text but not the abstract or the literature cited and tables (see below).
- 3) **Minimum** of 12 references of primary literature cited. In-text citations and Literature Cited sections must conform to the format of the guidelines described below (largely borrowed from Ecology, a prominent journal in our field)
- 4) Articles must include the following 6 sections, with each section separated by page breaks:
  - a. Cover page (title, authors, author affiliations, up to 5 keywords, acknowledgements) – This page is NOT circulated to the peer reviewers.
  - b. Title (maximum of 20 words) and Abstract (**maximum 200 words**) page.
  - c. Body text Introduction, Methods, Results, Discussion (**1500-2000 words**).
  - d. Literature Cited – follows requirements of Ecology Journal. Must prepare with citation management tool (Zotero, Mendelay, Endnote, etc.).
  - e. Tables (editable within word tables required), with table caption above table.
  - f. Figures (.png or TIFF files, 300 dpi embedded in the word file), with figure captions directly under each figure (no more than 100 words per caption).
  - g. Data – a properly formatted data file with all of the data used in the analysis must be included in the submission as an appendix.
- 5) Formatting requirements
  - a. Use 12 point Times New Roman font (**REQUIRED**), for all parts of the manuscript
  - b. Margins of the document must be 1" on all sides
  - c. Text **must be 1.5 spaced**
  - d. Line numbers are and page numbers are **required**
  - e. Do not alter the required and existing page breaks between sections!

- 6) After getting feedback from the peer review process (2-3 anonymous peer-reviewers from class, and another review from the instructor or GE), the author will need to carefully respond to **every** suggestion/criticism in a reply letter and make the changes to the manuscript file. The revised manuscript AND the reply letter will be considered by the OMEN editors when deciding whether to publish.