Field Marine Biology Course Syllabus

Hurricane Island, Maine — July 1 to 8, 2019

Professor:
Dr. Brent Lockwood
Email: Brent.Lockwood@uvm.edu

Course Objectives:
• To examine the basic principles of marine ecology
• To explore the natural history of marine environments
• To develop the skills needed to design and conduct field experiments
• To refine data analysis and presentation skills
• To gain an appreciation of human impacts on coastal ecosystems

Learning Outcomes:
Upon completion of this course, you should be able to:
• understand basic ecological principles that pertain to marine environments
• apply these principles to interpret scientific data
• apply these principles to perform field experiments

Textbook and Readings:
• Selected articles from the scientific literature will be provided.

Topics to be Covered:
• Intertidal species diversity
• Disturbance and recolonization
• Marine invertebrate life history strategies and recruitment
• Human impacts on marine ecosystems, including fishing, pollution, encroachment, and climate change
• Physiological ecology of intertidal organisms
• Rocky shore ecology
• Sandy beach ecology
• Pelagic open-water ecosystems
• Keystone species
• Species interactions and competition for space in the intertidal zone
• Oceanographic processes, nutrients, and productivity
• Marine protected areas—science and conservation
• Pre- and post-settlement processes that structure the intertidal community
• Introductory statistics in R

Expectations, Course Assignments, and Grading:

You are expected to complete readings before lectures and to participate in class discussions and field-based activities. The focus of the field-based exercises will be to discover and manipulate the biotic and abiotic forces that structure marine communities. The field exercises will give you hands-on experience with the scientific method and a chance to witness many phenomena in marine biology. You will be working with live organisms that live in dynamic environments. There is a good chance that you will be exposed to harsh weather and adverse environmental conditions. Therefore, be prepared to feel uncomfortable at times. Each day will consist of a mixture of lecture and field-based activities (scheduled around the prevailing low
Field Marine Biology Course Syllabus

tides). Designated time will also be devoted to data analysis, and preparation of oral
presentations.

**Pattern Journals:** You will keep an organized field notebook in which you will record your
observations of natural phenomena. Each day you are responsible for recording at least one
entry in which you describe a pattern in nature. The format of the pattern entries is as follows:

- **Title**
- **Location**
- **Date/Time**
- **Statement of pattern:**
  - 1 sentence summary—including both positive and negative (e.g., presence and
    absence of something; where is it found and where is it not found?)
- **Written description:**
  - 3-5 sentences. Where and when is the pattern observed? Describe the pattern and
    what you found striking or interesting. Define parameters (e.g. temperature, size,
    quantity).
- **Drawing:**
  - Draw a schematic of the pattern that is detailed and fully labelled.
- **Graph:**
  - Plot the relationships of the parameters that relate to the pattern, with x and y axes,
    to illustrate a theoretical representation of the pattern.
- **Hypothesis:**
  - State a hypothesis that provides an explanation for the pattern.
- **Experiment:**
  - Design an experiment that would test your hypothesis.

**Oral Presentations:** You will be responsible for presenting a 10-minute talk of a proposal of an
experimental plan, which you will design based on one of your field observations that you record
in your pattern journal. The purpose of this assignment is to get you to hypothesize the cause of
a particular pattern that you observe and to get you thinking about how you would test that
hypothesis. Each presentation should include the following:

- **Background and Motivation**
- **Experimental Design**
- **How you would analyze your data**
- **Conclusions and Broader Implications**

**Grades:**
- Field participation [30%]
- Discussion participation [20%]
- Pattern journals [30%]
- Oral presentation [20%]