



Appledore Island, Isle of Shoals, Kittery, Maine
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Shoals Marine Laboratory
Marine Environmental Science (BIOSM 1620; Section 2)
31 July - 14 August 2017

Course Syllabus and Schedule

Faculty: Laura Jordan-Smith, PhD (ljordan@ucla.edu)

Teaching Assistants:
Anastasia Kouros, James Tuttle

Prerequisites: Two year-long high school courses in science, and completion of grades 10, 11 or 12

Class enrollment limit: 20

Credit: 3 credits through Cornell

Course Objectives/Goals:

Environmental studies have become an integral component of high school programs all around the country; however, opportunities to apply this course work to the marine environment are limited. Marine Environmental Science will explore the diversity of coastal marine habitats and ecosystems and the tools scientists use to study them, with an emphasis on topics related to human impacts and environmental health.

Fieldwork will include explorations along Appledore's rocky intertidal zone, excursions to neighboring islands to observe seal and seabird colonies, and offshore trips to practice oceanographic sampling techniques and observe whale foraging grounds. Laboratory exercises will include observation and identification of plankton under the microscope, and familiarization with invertebrate and vertebrate adaptations through observation and dissection. Lectures and discussions will expose students to topics in marine ecology, oceanography, and climate science. Finally, we will study how humans have influenced the ocean and discuss how we can be stewards of marine ecosystems.

A major component of this course is a group research project, in which students are expected to apply the scientific methods they have practiced in the field and lab to address a research question of their own design on Appledore Island.

Course Materials:

If possible, we highly recommend bringing a laptop computer for writing papers and a notebook for use during lecture, lab and field activities. We also require sturdy, close-toed shoes, dive booties or rubber boots with tread for work in the intertidal zone. Snorkeling gear and binoculars are optional and suggested if you have them. Also, bring sun protection and layers for wind and rain. A flashlight or headlamp is also necessary.



Cornell University



University of
New Hampshire

Assignments & Grading:

- Required Assignments: Each student will write one Transect Report and within small groups, each student will also design and carry out a Research Project with a presentation. Rubrics will be provided for all required assignments so all expectations for grading are clear.
- Exams: There will be a Laboratory Practical exam and a Final (open-note) Exam with mandatory group study sessions preceding both exams.
- Full and active participation, including active reading of articles and preparation for class activities

Category/Assignment	Points
Participation	100
Exam	200
Lab Practical Exam	150
Research Project	200
Research Project Presentation	100
Transect Report	200
Marine Mammal Debate	50
Peer Editing	50
Other Laboratory & Field Exercises & Class Blog	150
Total	1200

Expectations and Conduct:

Students are responsible for fully understanding all of the information presented in this syllabus. If there are any questions regarding this information, it is the student's responsibility to bring it to the instructor's attention. In addition, students are responsible for attending all activities associated with this course and completing all assignments. Students are responsible for asking questions anytime they need clarification (remember, there is no such thing as a bad question).

Every student is responsible for their own behavior- specifically in being respectful and collegial to other students and with instructors. Students are responsible for fully understanding and adhering all of the information presented in the SML Appledore Handbook (http://www.sml.cornell.edu/sml_forms.html)

- Personal Technology.* Do not use cell phones, smart phones, iPads, mp3 players, headphones, or similar devices in the classroom or during course activities. If you take notes with your computer, disable wireless access during lecture (taking notes by hand is strongly recommended).
- The lab has a modest computer facility in Lighton Library; please treat this shared facility with respect. Printers are available, but please limit printing to your FINAL document (if required).
- Transmission of Course Materials.* Students are not authorized to replicate, reproduce, copy or transmit lectures and course materials presented, or derivative materials including class notes, for sale or free distribution to others without written consent of the instructors who are the original source of the materials.
- Academic Integrity.* Any work submitted must be your own. Uncredited use of another person's words, data or images is considered plagiarism, a serious violation of the Code, whether the material comes from another student, a web site, or a published paper. Students must adhere to Cornell's and UNH's Policy for Academic Honesty/Plagiarism and Discrimination
 - Cornell: <http://cuinfo.cornell.edu/aic.cfm>
 - UNH: <http://www.unh.edu/vpsas/handbook/welcome-university-new-hampshire>
- Disabilities & ADA Accommodation:* Students with a disability must contact Cornell's (420 CCC building; 607-254-4545) or UNH's Student Disability Services (<http://www.unh.edu/disabilityservices>) four weeks prior to start of class for confidential discussion of needs and for registration to verify eligibility for academic accommodations. No retroactive accommodations can be made.
- Mental Health:* Shoals Marine Laboratory cares about you and your well-being. If you experience unusual personal or academic stress during the course or need to talk with someone about a personal problem, seek support from your instructors as soon as possible. In addition, any SML staff is available for consultation 24/7. Find staff in the office in the Hamilton House between 8am – 7pm or knock on the door of Bartell House after hours

Schedule: Daily schedules at Shoals Marine Laboratory are flexible in order to accommodate predictable events (e.g. tides), to take advantage of unforeseen opportunities to experience the marine environment, and to participate in campus-wide marine science lectures and field opportunities. MES's daily routine may include early morning collecting trips to the intertidal zone.

Three meals are served on the island each day, except Sunday, when schedules are more relaxed and begin after a mid-morning brunch. Between meals, students should expect to be fully engaged in lectures, fieldwork, and laboratory exercises each day. After dinner and outside of formal class hours, students may be expected to study for exams, work on research projects, or attend guest lectures.

Island Life: Days on Appledore are filled with academic endeavors, but students do have free time around meals when they can use the island's volleyball court, swimming area, or library. SML encourages MES participants to interact with the entire island community. Musicians should feel free to bring an instrument to the island and share a song with other students, faculty and staff. Additionally, one morning or afternoon each week, students join in a general cleaning of the island and its facilities.

Daily Schedule:

Day 1: Monday July 31

4:15 Student arrival
4:30 Island Intro: Fire and water/Facilities tour/Course Logistics
6:00 Dinner
7:00 Lecture: Course Intro & Scientific Observation
8:00 Field: Appledore Orientation Sunset Hike and Ice Breakers (sunset 8:04pm)
10:00 Dorms

Day 2: Tuesday August 1

7:30 Breakfast
8:30 Lecture: Ocean Environment, Tides & The Intertidal
10:00 Lecture/Lab: Intro to Diversity of Life: Macroalgae, & Intro to Invertebrates
12:30 Lunch
1:30 Field: Intertidal collection & Identification (LT @ 1:06pm)
3:45 Lecture/Lab: Invertebrates & Create class list of macroalgae and invertebrates
6:00 Dinner
7:00 Lab: Practice using transects and quadrats, Brainstorm group project ideas
8:00 Rock Talk
10:00 Dorms

Day 3: Wednesday August 2

7:30 Breakfast
8:30 Lecture: Spineless but Spectacular: Invertebrates & Ecological Interactions
10:00 Lab: Invertebrate & Macroalgae Extravaganza
11:30 Workshop: Research team meetings & outlines
12:30 Lunch
1:30 Lecture: Intro to Plankton & the Open Ocean
2:30 Lab: Group Study for Lab Practical
4:00 Food Run
4:30 Boat: Environmental Testing & Plankton Tow
6:00 Dinner
7:00 Lab: Plankton ID & observation
10:00 Dorms

Day 4: Thursday August 3

7:30 Breakfast
8:30 Lecture: Intro to Marine Vertebrates, The Wonderful World of Fishes: Part 1
10:00 Boat: Hagfish recovery
12:30 Lunch
1:45 Lab: Fish Diversity & Study for Lab Practical

3:00 Workshop: Research Project Outline
4:30 Lab: Review for lab practical (lab closed at 5:30)
6:00 Dinner
8:00 **EXAM: LAB PRACTICAL**

Day 5: Friday August 4

7:30 Breakfast
8:30 Lecture: The Wonderful World of Fishes: Part 2
9:30 Workshop: Research project (**Outline Due**) / Field: High Tide Snorkel (HT 9:51am)
12:30 Lunch
1:30 Field: Intertidal Transect Visit #1 (LT 3:39pm)
3:30 Workshop: Introduction to data consolidation/analysis
4:30 Workshop: Reading a Scientific Research Paper
6:00 Dinner
7:00 Lecture: Scaled, Furred & Feathered Marine Vertebrates
10:00 Dorms

Day 6: Saturday August 5

7:30 Breakfast
8:30 Boat: Fishing trip
10:30 Lecture: Fisheries: Past, Present & Future
11:30 Workshop: transect data & report
12:30 Lunch
1:30 Lab: Dissection Stations
3:15 Field: Intertidal Transects Visit #2 (LT 4:22PM), consolidate data
4:45 Workshop: Research Project
6:00 Dinner
7:00 Movie ***turn in field/lab book**
10:00 Dorms

Day 7: Sunday August 6

Time to Work on Transect Report / Research Project
10:00 Brunch
11:00 Lecture: Exploring Other Marine Ecosystems
12:30 Lab: Transect Reports
3:30 Workshop: Research Project
5:00 Supper
7:00 Boat: Trip to Star Island
10:00 Dorms

Day 8: Monday August 7

7:30 Breakfast
8:30 Lecture: Marine Conservation Part 1
9:30 Workshop: Transect report / Research Project **Transect Report – due by 12pm**
12:30 Lunch
1:30 Lecture: Marine Conservation Part 2
2:30 Workshop: Intro to Marine Mammal Debate
4:30 Boat: Seal observation (LT 5:41pm)
6:00 Dinner
7:00 Movie (marine mammals)

Day 9: Tuesday August 8

7:30 Breakfast
8:30 Lab: Carbon footprint
10:00 Workshop: Marine Mammal Debate Prep
11:00 Workshop: Echolocation Activity
12:30 Lunch
1:30 Workshop: Research Project / Debate
4:30 Field: Marine Debris
6:00 Dinner
8:00 Rock Talk
10:00 Dorms

Day 10: Wednesday August 9

7:30 Breakfast
8:30 Workshop: Research Project / Paper writing
10:00 Boat: Whale Watch
2:30 Workshop: Marine Conservation Discussion *The Darkening Sea & Seaweed on your Dinner Plate*
4:00 Food Run
4:30 Workshop: Marine Mammal Debate
6:00 Dinner
7:30 **Debate: Marine Mammals in Captivity**
10:00 Dorms

Day 11: Thursday August 10

7:30 Breakfast
8:30 Lecture: Topic of Choice
9:30 Workshop: Research Project Paper / exam review
12:30 Lunch
1:30 Workshop: Research Project Paper / exam review
3:30 Boat: White Island Tern Restoration
6:00 Dinner
7:00 Workshop: Peer editing (**Paper Draft due**)
10:00 Dorms

Day 12: Friday August 11

7:30 Breakfast
8:30 Field: Intertidal Last Exploration & Review (LT: 8:05am)
10:30 Workshop: Exam Review / Research Projects
12:30 Lunch
1:30 Workshop: Paper revisions / Presentation Prep
3:00 Field: high tide snorkel / review (HT 2:23)
4:00 Final exam gametime review!
6:00 Dinner
7:00 **EXAM: Final**, open note (in P-K) ***turn in field/lab book**
10:00 Dorms

Day 13: Saturday August 12

7:30 Breakfast
8:30 Workshop: Presentation prep / Paper revisions
12:30 Lunch
2:00 **Presentations: MES2 Research Symposium**
6:00 Dinner
7:00: Boat: Night time plankton tow
10:00 Dorms

Day 14: Sunday August 13

10:00 Brunch (**Final Paper Due**)
11:00 Personal packing time
12:00 Class t-shirts
2:30 Clean up Lab and Dormitory
4:00 Course evaluations
5:00 Dinner
6:00 Lecture: Career paths
7:00 Boat: Final Sunset Trip to Star Island
9:15 Movie and popcorn

Day 15: Monday August 14

7:30 Breakfast
8:30 Final Packing & clean up
9:45 Departure