



Appledore Island, Isle of Shoals, Kittery, Maine
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Shoals Marine Laboratory
Introduction to the Biology of Sharks, Skates, & Rays (BIOSM 1640/MEFB XXX)
Dates August 8-15

Course Syllabus and Schedule

Faculty: Dr. Laura Jordan (laurakjordan@gmail.com)

TAs: Brian Magnier: brm77@cornell.edu, Ashley Stoehr: ashley.stoehr@gmail.com

Prerequisites: None

Class enrollment limit:

Credit hours: 3

Course Objectives/Goals:

Our main objective is to discover the current state of knowledge of elasmobranch (shark, skate & ray) biology and explore areas for future research and conservation initiatives. This includes separating fact from fiction, analyzing various types of media including peer reviewed scientific literature, and exploring experimental methods in both laboratory and field settings for studying sharks, rays, and other marine life.

Course Materials:

Required/Suggested textbooks and/or references

To be determined: Reading assignments will include a variety of types of literature from both popular media and scientific literature.

Assignments & Grading:

a. Required Assignments (Projects, Oral Presentations, Field Notebooks, etc.)

Elasmobranch Family Tree: Review the basics of phylogenetics in this group project where each team will figure out how and why elasmobranchs are separated into different groups and how they all fit together in the big picture.

Anatomy & Physiology Exercise: This exercise will give you the chance to relate form to function for major body parts and systems and explore how they differ within elasmobranchs and what those differences might mean for these animals.



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Shark Tracking Activity: Explore how advances in technology have helped us gain appreciation for the distribution and movements of elasmobranchs and how they can be applied to conservation efforts.

ElasMedia: Choose a recently produced media form (film, book, TV series/special, 2 written articles, 3 short videos) starring an elasmobranch, then write a short summary of the media example you chose. Next write a one paragraph response to how the film/book/show/articles/videos made you feel and think about the animals portrayed. Finally discuss how and why it elicited this response through language, music, cinematography etc. Finally, can you identify any incorrect or inaccurate information and expand on why you think the creator may have included it?

Outreach Project: It's time to get creative! To complete this project you will choose a topic related to elasmobranch conservation and produce your own form of media to communicate information to the general public or specific audiences like fishermen or tourism operators. Types of media include infographics, videos, guides and more! As a part of this project you will give a presentation explaining why it is useful and how it is effective.

Experimental Design Activity: After reviewing what we know and don't know about elasmobranchs it's time to think about what sort of experiment you could design to address one of the unanswered questions.

Class Blog: Students will also post about their learning experiences on our class blog!

Evaluation:

Your points for this class will result directly from your participation and performance on the projects, exercises, and activities described within this syllabus. The course will total to 1,200 points.

Category/Assignment	Points
Participation	100
Elasmobranch Family Tree	100
Anatomy & Physiology Exercise	150
Shark Tracking Activity	100
ElasMedia Analysis	100
Outreach Project	200
Experimental Design Activity	200
Outreach Project Presentation	100
Other Laboratory & Field Exercises, Class blog & Trivia	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)

1. *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.

2. The lab has a modest computer facility in Loughton Library; please treat this shared facility with respect. Printers are available, but please limit printing to your FINAL document (if required).
3. *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.
4. *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
 - A. Cornell: <http://cuinfo.cornell.edu/aic.cfm>
 - B. UNH: <http://www.unh.edu/vpsas/handbook/welcome-university-new-hampshire>
5. *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.
6. *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:

Day 1: Monday August 8

- 4:15 Student arrival
- 4:30 Island Intro: Fire and water/Facilities tour
- 6:00 Dinner
- 7:00 Lecture: Course Intro & Burning Elasmobranch Questions! Family Tree Assignment
- 8:00 Field: Appledore Orientation Sunset Hike and Ice Breakers
- 10:00 Dorms

Day 2: Tuesday August 9

- 7:30 Breakfast
- 8:30 Lecture: Elasmobranch Diversity & Ocean Life
- 10:00 Boat: Fishing Trip
- 12:30 Lunch
- 1:30 Lecture: Intro to Elasmobranch Anatomy & Physiology
- 2:30 Lab: Elasmobranch Diversity & Dissection Stations
- 4:00 Workshop: Elasmobranch Family Tree
- 6:00 Dinner
- 7:00 Workshop: Anatomy & physiology exercise / How to read a research paper
- 8:00 Rock Talk
- 10:00 Dorms

Day 3: Wednesday August 10

- 7:30 Breakfast
- 8:30 Lecture: Structure & Function- Swimming, Sensory, Feeding
- 10:00 Workshop: Elasmobranch Family Tree (**Family Tree Due**)
- 12:30 Lunch
- 1:30 Lecture: Reproduction & Migration
- 2:30 Lab: Shark Tracking Activity, Anatomy & physiology exercise
- 4:00 Food Run
- 5:00 Workshop: Outreach Project Outlines / Field: High Tide Snorkel
- 6:00 Dinner
- 7:00 Anatomy & Physiology Exercise / Outreach Project
- 10:00 Dorms

Day 4: Thursday August 11

7:30 Breakfast
8:30 Lecture: Learning & Behavior
9:30 Boat: Marine mammal & seabird observation
12:30 Lunch
1:30 Lecture: Fisheries & Bycatch
2:30 Workshop: Outreach Project / Anatomy & physiology exercise (**Anatomy & Physiology Exercise Due**)
4:30 Workshop: Sharks in the Media, ElasMedia Assignment
6:00 Dinner
7:00 Movie
10:00 Dorms

Day 5: Friday August 12

7:30 Breakfast
8:30 Lecture: Changing Ecosystems
9:30 Boat: Environmental Testing / Bycatch Reduction
11:00 Workshop: ElasMedia Assignment (**ElasMedia Due**)
12:30 Lunch
1:30 Lecture: Basics of Experimental Design, Elasmobranch Case Studies
2:30 Workshop: Experimental Design / Outreach Project
4:30 Workshop: Outreach Project
6:00 Dinner
7:00 Workshop: Experimental Design / Outreach Project (**Outreach Project Draft Due**)
10:00 Dorms

Day 6: Saturday August 12

7:30 Breakfast
8:30 Lecture: Topic of Choice
10:30 Workshop: Outreach Project Presentation
12:30 Lunch
1:30 Workshop: Experimental Design Project
4:30 Workshop: Outreach Project Revisions (**Experimental Design Project Due**)
6:00 Dinner
7:30 Game night! Trivia Time!
10:00 Dorms

Day 7: Sunday August 14

(Outreach Project & Experimental Design Project work time)
10:00 Brunch
11:00 Workshop: Outreach Project
12:00 **Outreach Project Presentations (Outreach Project Due)**
3:00 T-shirt time!
4:00 Course Evaluations, personal packing
5:00 Supper
6:00 lab cleanup / dorm cleanup
7:00 Boat: Trip to Star Island
9:15 Movie

Day 8: Monday August 15

7:30 Breakfast
8:30 Final Packing & clean up
10:00 Departure

Elasmobranchs (sharks, skates, and rays) are the subjects of numerous headlines and blockbuster movies, but what do we really know about them? Join us for your opportunity to learn to separate the myths from the reality to better understand these fascinating animals. During this course you will find opportunities to immerse yourself in the study of marine science, elasmobranch biology, and conservation, and put your scientific knowledge and experiences into action while learning to look at the world around you from new perspectives. Get ready for a great adventure!