Shoals Marine Laboratory
Introduction to the Biology of Sharks, Skates, & Rays (BIOSM 1640)
Dates August 13-20

Course Syllabus and Schedule

Faculty: Dr. Laura Jordan (ljordansmith@sandiego.edu)

TAs: Ashley Stoehr, Scott Lynch

Prerequisites: None

Class enrollment limit: 20

Credit hours: 1

Course Objectives/Goals:
Elasmobranchs (sharks, skates, and rays) are the subjects of numerous headlines and blockbuster movies, but what do we really know about them? 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. Get ready for a great adventure!

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 for work on research vessels and in the lab. 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 useful. Reading assignments will include a variety of types of literature from both popular media and scientific literature.

Assignments & Grading:
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.
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. 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? This will be done before you get to the island, info via email!

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 what you have created 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 1,150 points.

<table>
<thead>
<tr>
<th>Category/Assignment</th>
<th>Points</th>
</tr>
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<tbody>
<tr>
<td>Participation</td>
<td>100</td>
</tr>
<tr>
<td>Elasmobranch Family Tree</td>
<td>100</td>
</tr>
<tr>
<td>Anatomy &amp; Physiology Exercise</td>
<td>150</td>
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<tr>
<td>ElasMedia Analysis</td>
<td>100</td>
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<tr>
<td>Outreach Project</td>
<td>200</td>
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<tr>
<td>Experimental Design Activity</td>
<td>150</td>
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<tr>
<td>Outreach Project Presentation</td>
<td>100</td>
</tr>
<tr>
<td>Other Laboratory &amp; Field Exercises, Class blog &amp; Trivia</td>
<td>200</td>
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<tr>
<td>Total</td>
<td>1150</td>
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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 Laighton 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](http://cuinfo.cornell.edu/aic.cfm)
   B. UNH: [http://www.unh.edu/vpsas/handbook/welcome-university-new-hampshire](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](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:** 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. 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 are expected to work on class 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 students 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 August 13**
- 4:15 Student arrival
- 4:30 Island Intro: Fire and water/Facilities tour/Course Logistics (**ElasMedia Assignment Due**)  
- 6:00 Dinner
- 7:00 Lecture: Course Intro & Burning Elasmobranch Questions! Family Tree Assignment
- 7:40 Field: Appledore Orientation Sunset Hike and Ice Breakers (Sunset 7:43pm)
- 10:00 Dorms

**Day 2: Tuesday August 14**
- 7:30 Breakfast
- 8:30 Lecture: Vertebrates, Elasmobranch Diversity & Ocean Life
- 10:00 Boat: Fishing Trip #1 (& Introduction to Environmental Testing)
- 12:30 Lunch
- 1:30 Lecture: Intro to Elasmobranch Anatomy & Physiology
- 2:45 Lab: Elasmobranch Diversity & Dissection Stations
- 4:30 Workshop: Elasmobranch Family Tree
- 6:00 Dinner
- 7:00 Workshop: Anatomy & physiology exercise
- 8:00 Rock Talk
- 10:00 Dorms

**Day 3: Wednesday August 15**
- 7:30 Breakfast
- 8:30 Lecture: Structure & Function- Swimming, Sensory, Feeding
- 10:00 Workshop: Elasmobranch Family Tree (**Family Tree Due by 12:30pm**)  
- 12:30 Lunch
- 1:30 Lecture: Learning & Behavior
Day 4: Thursday August 16
7:30 Breakfast
8:30 Lecture: Fisheries & Bycatch
10:00 Workshop: Elasmedia discussion, Outreach Project / Anatomy & physiology exercise
12:30 Lunch
1:30 Lecture: Changing Ecosystems
2:30 Workshop: Outreach Project
4:30 Lecture: Reproduction & Migration *guest lecture with Dr. Sulikowski*
6:00 Dinner
7:00 Anatomy & Physiology Exercise / Outreach Project
10:00 Dorms

Day 5: Friday August 17
7:00 Breakfast (Anatomy & Physiology Exercise Due)
7:30 Boat: Fishing Trip #2
3:30 Workshop: Outreach Project
4:30 Lecture: Basics of Experimental Design, Elasmobranch Case Studies
6:00 Dinner
7:00 Workshop: Experimental Design / Outreach Project (Outreach Project Draft Due)
10:00 Dorms

Day 6: Saturday August 18
7:30 Breakfast
8:30 Lecture: Topic of Choice + Careers in marine science
10:30 Field: Optional Tide Pool Exploration (LT: 11:27am, 0.6ft)
12:30 Lunch
1:30 Workshop: Experimental Design Project
3:00 Workshop: Outreach Project Presentation
4:30 Workshop: Outreach Project Revisions (Meet with instructor)
6:00 Dinner
7:30 Game night! (Experimental Design Project Due)
10:00 Dorms

Day 7: Sunday August 19
(Outreach Project work time)
10:00 Brunch
11:00 Workshop: Outreach Project (Load presentation by 11:30am)
12:00 Outreach Project Presentations (Outreach Project Due)
3:00 T-shirt time!
4:00 Course Evaluations, personal packing
5:00 Supper (*Course book due*)
6:00 lab cleanup / dorm cleanup
7:00 Boat: Trip to Star Island
9:15 Movie

Day 8: Monday August 20
7:30 Breakfast
8:30 Final Packing & clean up
10:00 Departure