MAR-S 395 -Spring 2014 Bioacoustics

School of Marine and Atmospheric Sciences Stony Brook University

Lecture: TBA

This course may the Pursue Deeper Understanding (STEM+) General Education Requirement [submitted for approval, but approval not received yet].

Instructor Information

Name : Joe Warren, Associate Professor
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Office Hours : TBA
Skype : joe warren

Course Description
Like humans, marine organisms use sound for a variety of purposes ranging from mate selection to predator and prey detection. This course will introduce the students to the basic physics of acoustics, principles of underwater sound, use of passive and active acoustics by animals, sound production and reception in marine animals, the effects of anthropogenic activities on the ecological soundscape, and the use of acoustics by scientists to study marine organisms. While primarily a lecture-based course, students will conduct several laboratory-style data collection and analysis projects using real data.

Prerequisites
None

Course Learning Objectives
Students will learn how organisms produce and receive acoustic signals. They will use skills acquired in this class to analyze acoustic signals used by biological organisms. By doing so they will further develop and build on these skills to be able to describe and understand the characteristics of these signals and their ecological uses by animals. Students are expected to expand their knowledge of math, physics, and marine science in this course.
By the end of this course you will be able to:

1. Describe how sound is generated by natural and anthropogenic sources and how it propagates through the ocean;
2. Collect and analyze sound recordings and apply quantitative tools to the use of passive and active acoustic recordings;
3. Describe and compare how marine organisms and humans receive, interpret and use sound;
4. Explain the impacts marine sound can have on organisms; and
5. Synthesize information from primary literature to evaluate current issues in marine sound.

Textbook

Required: None. Assigned readings will be posted on Blackboard.

Grading

Your grade in the course will be earned/calculated as follows:

- Problem sets & Lab Assignments 60%
- Midterm presentation 7%
- Final presentation 10%
- Final report 15%
- Class participation 8%

This scale serves as a general guideline; however, grades may be curved depending on the performance of the class. Plus and minus letter grades will be given where appropriate.

A, A→ 90– 100 B+, B, B→ 80– 89 C+, C, C→ 70– 79 D → 60– 69 F → 0– 59

Student Expectations

Students will attend class, be courteous, and do their best. Students will be prepared and active participants in the learning process.

Electronic Device Policy

No electronic devices [of any kind including audio devices] are to be used in the classroom unless you have received explicit permission from the instructor. With instructor permission certain devices (e.g. laptops) may be used to take notes during lecture. All devices not in use should be off or in silent/vibrate mode and remain in your bag, purse, pocket, etc. Students who do not follow these guidelines will be asked to leave the class immediately. This applies during any part of the lecture (including breaks). Do not answer calls during class. Text messaging is not allowed during class. YOU are responsible for ensuring this policy is followed.

General Course Rules

Late Assignments will not be graded except for exceptional circumstances. All problem sets will be submitted via BLACKBOARD. Preferably as pdf files. I don’t
care if you submit a document file or if you hand write your assignment and scan/photograph it and turn that in – as long as your work is legible. Keep a copy of any assignment you turn in!

For every assignment in this class, you are expected to 1) SHOW YOUR WORK; 2) INCLUDE UNITS; and 3) PROVIDE AN EXPLANATION FOR ANY FIGURES or GRAPHS that are in the assignment. Failure to do any of those three things will result in the loss of significant points on the assignment.

No food in lecture.

Independent Work Most of your assignments (including lab reports) are meant to be done by an individual student. While you are free to discuss problems and questions with your fellow students; each student must complete all parts of the assignment independently. Students who do not follow this requirement will receive a zero on the assignment, may have their final grade decreased, and may be referred to Academic Judiciary for further punishment. This applies to any students involved in academic dishonesty (copiers and copy-ees alike).

Group Work Some of the data collection and analysis will require you to work with other students to reach your final goal. All students whose names are on the final report are expected to have contributed substantially to the final product.

Problem Sets
Problem sets will be posted online and are due at the time/date listed on the assignment.

There will be approximately 6-8 problem sets for this course which make up 60% of your final grade. Doing poorly on the problem sets (or not doing them at all) will ensure you a poor grade.

Assignment Submittal Assignments will be submitted via blackboard. Students should not email assignments to the professor unless specifically requested. Assignments should consist of a SINGLE FILE (preferably a pdf) containing all figures, graphs, text, calculations, etc. Audio files may be uploaded as a separate file.

Audacity You may be using a software program called Audacity to assist you in analyzing the data that we collect during our labs (and you may find it useful elsewhere too). It is free for educational use and available for all computer platforms (Windows, Linux/Unix, and Mac); so you may wish to install it on your own computer. The website for the program is: http://audacity.sourceforge.net/ It is a great program, but not without its own “features” which you will soon discover. Other software programs will be introduced as needed in the course.

Absences Any unexcused absence will result in a significant loss of points towards your final course grade. Tardy == absent. If you are not attending class, YOU are responsible for informing
the professor ahead of time (by email or phone at least one hour prior to class start) if you will not be there. Informing the instructor that you cannot attend the lab does not make your absence “excused”. You are responsible for any material, data, analysis, or assignment that was covered during that lab. In short, do not miss class.

**Academic Honesty** If you are caught cheating on any assignment in the class, you will automatically fail that assignment and I reserve the right to give you a failing grade for the course.

**Blackboard** You can access class information, documents, and assignments on-line at: http://blackboard.sunysb.edu You should be sure to consult it at least once a week; ideally, you would log on before every class. Blackboard will be used to post class-related announcements. It is your responsibility to make sure that the email you check is the one you have marked as preferred on SOLAR so that you will receive copies of announcements. If you used Blackboard during the previous semester, your login information (Username and Password) has not changed. If you have never used Stony Brook’s Blackboard system: for help or more information see: http://www.sinc.sunysb.edu/helpdesk/docs/blackboard/bbstudent.php For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

**Electronic Communication Statement** Email and especially email sent via Blackboard (http://blackboard.stonybrook.edu) is one of the ways the faculty officially communicates with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education (http://www.stonybrook.edu/mycloud), but you may verify your official Electronic Post Office (EPO) address at http://it.stonybrook.edu/help/kb/checkingor-changing-your-mail-forwarding-address-in-the-epo.

If you choose to forward your official University email to another off-campus account, faculty are not responsible for any undeliverable messages to your alternative personal accounts. You can set up Google Mail forwarding using these DoIT-provided instructions found at http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail. If you need technical assistance, please contact Client Support at (631) 632-9800 or supportteam@stonybrook.edu.

**Critical Incident Management Initiative**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students’ ability to learn. Stony Brook expects students to maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people.
Stony Brook University Syllabus Information

Americans with Disabilities Act: If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or http://studentaffairs.stonybrook.edu/dss/. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.sunysb.edu/ehs/fire/disabilities.shtml

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the Academic Judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/ Critical Incident Management: Stony Brook University expects students to respect the rights, privileges and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students ability to learn.

Lecture Calendar
Please understand that this schedule is subject to change

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading Assignment</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Syllabus, Fundamentals of Acoustics</td>
<td>Ch. 1 (Bradley and Stern) Hansen, Fundamentals of Acoustics</td>
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<td>Week 2</td>
<td>Acoustic Units and Propagation</td>
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<td>Week 3</td>
<td>Signal Analysis, Measuring and Recording Sounds</td>
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<td>Week 4</td>
<td>Natural and Anthropogenic Sources</td>
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<td>Week 5</td>
<td>Active Acoustics -Natural and Anthropogenic</td>
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<td>Week 6</td>
<td>Active Acoustics -Detection and Ranging</td>
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<td>Week 7</td>
<td>Midterm Presentations &amp; Reports Due</td>
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<td>Week 8</td>
<td>Spring Break (No Classes)</td>
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<td>Week 9</td>
<td>Active Acoustics -Quantification</td>
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<td>Week 10</td>
<td>Passive Acoustics -Localization</td>
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<td>Week 11</td>
<td>Passive Acoustics -Identification</td>
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<td>Week 12</td>
<td>Animal Sound Production</td>
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<td>Week 13</td>
<td>Animal Sound Reception</td>
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<td>Week 14</td>
<td>Final Presentations</td>
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<td>Week 15</td>
<td>Final Presentations, Final Reports Due</td>
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