



## BIONB4200: EVOLUTION OF ACOUSTIC COMMUNICATION

“The language of animals is very ancient and, like other ancient modes of speech, very elliptical; little is said, but much is meant and understood” – Adapted from Gilbert White

**Course outcomes:** All living organisms communicate, and effective communication is critical to survival and reproduction. Acoustic communication is one of the most important and salient communication modalities, and is used by animals across taxa. After this course, you will be able to answer the question “How and why do animals use sound for communication” from the perspective of development, mechanism, function and evolutionary origins. This will provide you with a framework that will add to your understanding of how animal behaviors and traits come to be. In addition to gaining appreciation for the incredible diversity of acoustic signals, you will also recognize how answering basic science questions like these helps to inform translational and applied science, like conservation and global change mediation, and services like education and medicine; fields in which many of you will work. There will be one class meeting per week, all will involve active participation, including exploratory group work, class discussion of primary literature, hands-on demonstrations and field trips.

**Course description:** BioNB4200 is an upper level elective. BioNB2210 preferred as pre or co-requisite.

**Class meetings:** Wednesday 2:55-4:10pm. B104 CMS, Start: 26 August, End: 2 December 2015.

<i>Instructor</i>	<i>Office</i>	<i>Phone No.</i>	<i>e-mail</i>
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**Office hours:** After class, 1:30-2:30 Monday and Friday or by appointment

**Online material:** Website: <http://www.jenelledowling.com/#!/bionb4200/c8d5>. Password: bionb4200.  
Discussion board: <http://piazza.com/cornell/fall2015/bionb4200>

**Readings:** Articles, papers, and select chapters from *Principles of Animal Communication* (2<sup>nd</sup> ed), Bradbury & Vehrencamp (I will provide chapter scans). I will occasionally send out links to articles, videos and Cornell seminars on acoustic communication. You will get extra credit for incorporating what you learn from these into discussions or writing.

**Pre-class assignments:** We will use Piazza for assignments and discussion (link above). Thought questions based on each week’s reading are posted a week in advance and are **due each Tuesday night before midnight**. For technical problems with Piazza, email: [team@piazza.com](mailto:team@piazza.com)

**Field Trips:** There will be several field trips during class meeting time. Destinations will mostly be on campus, but may require some to use own transportation or help with carpooling.

**Attendance:** Students are allowed one late arrival and one absence without penalty. Students will lose participation points for additional lateness and absences that are not approved beforehand. If you don’t use your free lateness or absence you’ll get one extra credit points for each.

**Assessment:** Pre-class assignments, discussions, writing assignments and a final project will assess your understanding of course material. To accommodate different learning and communication styles, you will not be penalized if you are not outspoken in every class period (see below).



**Grading:** Participation and discussion (60% of grade) - You can demonstrate your understanding of course concepts by focusing effort on writing in your pre-class Piazza assignments, speaking up during in-class discussions, or both (for extra credit). Some participation in both is required, but feel free to focus on whichever works best with your strengths.

Writing assignments (30% of grade) - Three 2-3 page papers, topics discussed in class.

Final project (10% of grade) - 30 min presentation on a central course topic. Work in pairs to create a presentation, activity or field trip on your topic.

**How to do well:** 1) Check course material webpage each week, complete readings/activities and answer Piazza thought questions before Tuesday. 2) While reading, take notes on questions and comments to discuss in class. 3) Allow time to proofread/edit your writing assignments 4) Think about final project ideas throughout course. 5) Talk to me in office hours/after class.

**Course policies:** Students are held to Cornell's academic integrity code. Academic dishonesty of any kind, including plagiarism, will not be tolerated. See: <http://cuinfo.cornell.edu/aic.cfm>

Unit	Date	Topic	Readings	What's due?
Introduction	Aug 26	Course information	Syllabus	Sign up for Piazza
	Sep 02	Levels of analysis. Why do basic science?	Online reading/activity	Piazza 1
Acoustic mechanism	Sep 09	What is a signal? Properties of sound	B&V 1&2	Piazza 2
	Sep 16	Recording workshop: How we study sound	Online reading/activity	Piazza 3
	Sep 23	Field trip 1: Animal sound production	B&V 1&2	Piazza 4
	Sep 30	Neurobiology of signal production	Online reading/activity	Piazza 5 <b>Writing 1 (due 10/2)</b>
Signal development	Oct 07	Learned and innate vocalizations (guest speaker)	Online reading/activity	Piazza 6
Evolutionary origins	Oct 14	Evolution of the auditory system: signal receivers (guest speaker)	Online reading/activity	Piazza 7
Function of signals	Oct 21	Movie on multi-functionality of signals	Online reading/activity	Piazza 8 <b>Writing 2 (due 10/23)</b>
	Oct 28	Field trip 2: Sexual selection and signals	B&V 12	Piazza 9
Applications to other fields	Nov 04	Conservation, education, human health	Paper	Piazza 10 <b>Writing 3 (due 11/6)</b>
Final assessments	Nov 11	Final presentations		TBA
	Nov 18	Final presentations		TBA
	Nov 25	Thanksgiving Break- No class		None
	Dec 2	Final presentations		TBA