

Swipe Right: Flirting Across the Animal Kingdom

College of Natural Sciences – First Year Seminar

Course ID: NATSCI 191/CNS 39

Term: Fall 2016

Instructor: Dan Vahaba (dvahaba@cns.umass.edu); PhD Candidate in Neuroscience & Behavior

Class Time & Location: Mondays

- Section 01 - 11:15am – 12:05pm → Lederle 145
- Section 02 - 1:25 – 2:15pm → Lederle 1234

Office: 523 Tobin Hall;

Office Hours: I'm happy to meet with you by appointment – to set up a time to meet, feel free to contact me via email or through here: <https://dan-vahaba.youcanbook.me>

Course Site: <https://moodle.umass.edu/>

What is this course about?

Overall, this course is designed to provide you with the skills to “think like a scientist” using the topic of courtship communication and neurobiology to guide our meetings and discussion.

“Thinking Like a Scientist” (primary course focus): For most people, science is a nebulous process of faceless people in white lab coats studying neon colored test tubes and watching mice behave in a cage. In reality, it's looks a lot less “sexy”, and is a much more complicated process that requires thorough forethought, critical thinking, and evaluation of data. One of our primary focuses this semester will be understanding the research process, reading primary scientific articles, and learning how to interpret and communicate scientific findings.

Courtship Communication (course content topic): Landing a date can be hard and sometimes you just can't find the right words to attract your love interest. But don't fret - you're not alone! Across the animal kingdom, many other species are in a similar predicament, and have evolved fascinating communication systems in order to advertise themselves in hopes of finding a companion. This course will explore the brains and behavior that lead to complex communication acts different animals employ to attract a mate, including birds that moonwalk, and fish that talk through electricity.

How will this course help you succeed?

“Thinking Like a Scientist” goals: By the end of the course, you should be able to answer the following questions on how to think and act like a scientist:

- What is the scientific method? How do scientists generate and test hypotheses?
- What are characteristics of an informative experimental design?
- How can we evaluate and analyze data?

- How do you translate and communicate scientific findings for a general audience?
- What databases and library resources are available to me to find primary research articles?

Courtship Communication goals: Throughout the semester, we will go over different courtship communication methods, modalities, and the neural mechanisms that enable them, which should allow you to answer the following questions:

- What are some of the diverse and complex courtship communication systems that exist? What are some the neural mechanisms, circuits, and chemicals that enable them?
- Do communication signals reflect the true quality of the “sender”? How do “receivers” perceive and evaluate a potential mate’s communication signal?
- How do vocal communicating animals learn their species-specific communication during development? How do these species differ from innate (non-learning) species?

UMass/CNS goals: UMass is a large university, with many majors within the College of Natural Sciences (CNS), and plenty of largely-populated classes (especially in the first few years). As such, you will have numerous opportunities to work small group of your peers in this class, and go learn about the different researchers and research opportunities in CNS, enabling you to answer these questions:

- Who are some of the different researchers at UMass? How do I find a research lab to volunteer in? How do I contact a professor whose lab I’m interested in working in?
- What are the different types of majors in the College of Natural Science at UMass? Which major(s) best suites my interest?

What will you do in this course?

The class periods will vary in structure. They will include lectures, group work, activities, writing, discussions, and experiments* (*if all goes well!) revolving around the topics of thinking like a scientist and courtship communication.

What materials will you need?

All of the materials necessary for this course will be provided for you on the course Moodle site. In addition to required readings, you may need to consult additional resources to help you understand some of the ideas and science behind certain topics and articles.

How will you succeed in this course?

- **Keep on top of your email.** I will communicate with you via email, and I expect that you will check it routinely, at least every day or two. To save paper, course assignments and

other material will be posted on Moodle rather than distributed in class. There are public computer terminals available in the libraries and elsewhere on campus if you need one.

- **Ask if you have questions about the material.** While I've strived to pick a topic that should be of interest to all CNS majors, I understand that students arrive in class with different levels of knowledge and interests. If you need more background, please ask.
- **Participate in class.** I strive for an informal, interactive class environment in which questions and discussion are routine, enjoyable and provocative. I ask that you to take responsibility for participation. I expect you to be ready to discuss, ask questions, and to look alert (bring caffeine if you like). **I ask that you do not to read newspapers or check your phone, Facebook, or engage in other distracting behavior** while in class. (Research has shown that a large majority of students find this behavior in their neighbors to be distracting—and has also shown that students are reluctant to ask their peers to stop. So consider yourself asked.) I understand that speaking up in class is more difficult for some people than others, so we'll make sure to have a variety of discussion formats ranging from the whole group to very small groups.
- **Please bring extra paper** to each class for in-class assignments.

How will you and I evaluate your progress?

Total points possible = 100

<i>Assignments</i>	Points	# events	Total possible
Attendance and discussion	3	8	24
Finding primary research articles	10	1	10
Reading guide for primary research article	10	1	10
<i>Primary vs Pop Sci "project"</i>			
Primary article summary; differences between the 2 articles (pop + primary)	10	1	10
Science in plain English	15	1	15
<i>Cockroach project</i>			
pre-experiment write-up (individual)	10	1	10
post-experiment write-up (group)	20	1	20
<i>1 bonus point!</i>	1	1	1
	Total pts		100

Here's a (brief) summary of the different sources of points. More details/information about each assignment will be made available as the semester progresses.

Attendance and Discussion: This class will involve a lot of in-class group work and discussions. As such, your presence and participation are required. Attendance will either be intermittently

assessed directly or through small in-class activities or writing tasks throughout the semester. While being in-class is important, participating and contributing to fruitful conversation will also be imperative. As such, it will be possible to lose points for lack of participation.

Finding primary research articles: Along with observations of the natural world, many scientific endeavors are guided by previously published research. Finding previous studies to inspire your own requires sifting through literature using academic databases, such as *Web of Science*. As such, We'll going over the basics of finding "good" empirical research articles using various databases that UMass has to offer. This will help you both throughout the course and for other courses requiring an understanding of background literature for your field or topic.

Reading guide for assigned primary research article: While most of you are familiar with studying textbooks to learn about principles of science, we'll delve into the primary literature that forms the infrastructure of any scientific discipline's textbook. To assist your readings, you'll be asked to fill out a reading guide to help make sense of the research article.

Cockroach project: The best way to learn how to think (and act) like a scientist is to do science. For this project, we'll be studying how cockroaches use olfactory (pheromone) signals for courtship communication by studying their mating behavior and neural activity (in-class!). This part of the course will give you hands-on experience formulating a research question, testing your hypothesis, generating and analyzing data, and thinking about what your results mean in a broader context.

Primary vs Pop Sci project (how to translate science for the public): As scientists, you'll be asked to communicate complicated information and concepts for a general audience. To prepare for this, we'll go over how to extract and translate scientific findings for a laymen readership. For this assignment, you'll use a creative media format (think SnapChat stories, Twitter tweets, or a BuzzFeed "listicle") to tell the less scientific-literate world about your research article, in plain English.

Extra Credit: While I hope everyone will do well in this course, I understand that sometimes you may be unable to attend class or complete an assignment on time. To make up for any lost points, you have a few different extra credit opportunities for up to a **total of 10 points maximum**. These assignments can be turned in at any point of the semester. The last day you can submit an extra credit assignment is during our last class meeting (December 12th).

(1) Attend a College of Natural Science seminar: Attend a CNS seminar in any program/department and turn in a one-page reflection and summary on the talk (topic/background, methods, results, interpretations). You can submit a **maximum of two seminar summaries** over the duration of the semester **each worth 2 points** (max. = 4 points total). The seminars for CNS can be found here: <http://www.cns.umass.edu/research/seminars>

(2) Various assignments on Moodle: there are several assignments and instructions on the course Moodle page (in the “Extra Credit Opportunities” folder). Feel free to contact me for more details and information. Each assignment on Moodle is **worth 2 points** each.

Grading scheme:

94 – 100 A	80 – 83 B-	66 – 69 D+
90 – 93 A-	76 – 79 C+	64 – 65 D
86 – 89 B+	74 – 75 C	60 – 63 D-
84 – 85 B	70 – 73 C-	< 60 F

What are the course policies?

Attendance: Attendance at each seminar is expected, and unexcused absences will directly affect your grade for participation. You must notify me before the morning of class in order to be excused. If you have an emergency or a long illness, you should contact me **as soon as possible**. Please do not wait to contact me, as many options are then closed. I understand that emergencies come up, so if you do miss class, please follow up and contact me to let me know

Professional and academic integrity: All students are expected to adhere scrupulously to the University policy concerning academic honesty, which is found in “Undergraduate Rights and Responsibilities” at the following web site: <http://www.umass.edu/ombuds/honesty.php/>. Plagiarism is representing someone else's work as your own. This includes copying information from any website without proper citation, copying someone else's paper, buying a paper, or letting someone copy your work. Plagiarism will be discussed in class and you will be expected to understand what constitutes plagiarism. You are expected to understand your sources sufficiently well to write your own paper *in your own words*. In general, **good writing means a minimal use of direct quotes**. Sources for the ideas that you have paraphrased must be cited. **Plagiarism also includes copying the words in a paper, even if the source of the material is cited**. In addition, plagiarism (as defined by the Code of Conduct) includes submitting work done for another course to this course without prior permission of your instructor.

All cases of plagiarism, regardless of the extent, will be referred immediately to the course coordinator. The *minimum* penalty is a zero on the assignment. The *maximum* penalty is a zero for the course. The penalty will be decided by the course coordinator on a case-by-case basis. This penalty will be given both to a person who plagiarizes material and for anyone who allows his or her work to be copied. A report will be filed with the Academic Honesty Board.

Disabilities Statement: The University of Massachusetts Amherst is committed to making reasonable, effective and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you are in need of accommodation for a documented disability, register with Disability Services to have an accommodation letter sent to

your faculty. It is your responsibility to initiate these services and to communicate with faculty ahead of time to manage accommodations in a timely manner. For more information, consult the Disability Services website at: <http://www.umass.edu/disability>

Tentative Fall 2016 Class Schedule*

Week	MONDAY (unless noted otherwise)	Topics	Assignment Due
1	Sept. 12	Introductions	Nothing! It's the first day.
2	Sept. 19	How and why animals use courtship communication & How to find a primary research article	
3	Sept. 26	From behavior to neurons – how synapses and circuits lead to behavior & How to read a scientific paper	Found primary research articles
4	Oct. 3	Singing & Scientific paper discussion	Science article reading guide
5	Oct. 11 - **TUESDAY**	Listening & Developing a research question and testing a hypothesis	
6	Oct. 17	Smelling & Designing an experiment	
7	Oct. 24	Dancing & Preparation for cockroach experiments	Pre-experiment write-up
8	Oct. 31	Cockroach experiments day #1 - Behavior	
9	Nov. 7	Cockroach experiments day #2 – Neurophysiology	
10	Nov. 14	Ornamentation & Cockroach data analysis, designing an informative graph, and interpreting the results	
11	Nov. 21 – Thanksgiving recess; no class.		
12	Nov. 28	Science communication & Intro to “Science in Plain English” assignment	Post-experiment write-up
13	Dec. 5	Primary vs. popular science discussion & Careers in science	Write-up on article summary and pop vs. primary differences
14	Dec. 12	Course wrap-up & Student evaluations	Science in plain English & last day for any extra credit assignments

*Note – assignments, topics, and due dates may change across the semester. I will always keep you posted on if/when things are altered.