

This syllabus is for a biology course I taught at Grinnell College

Animal Behavior

Science 1021 • MWF 10:00am to 10:50am • Labs: W 1:00pm to 3:50pm, Science 1007

Instructor: Dr. Susan Villarreal, Science 1820, x4518, villarre@grinnell.edu

Office Hours: Monday 1:00PM – 5:00PM
Tuesday 9:30AM – 11:00AM; 1:30PM – 5:00PM

Course Site: PioneerWeb

Required text: *Animal Behavior* 2nd edition by Shawn Nordell and Thomas Valone

Course Description

Investigations of the causes, functions, and origins of animal behavior. We will use an evolutionary perspective to understand and integrate common behavioral adaptations, e.g., obtaining food, avoiding predators, living in groups, communicating, mating, and caring for offspring. Laboratory projects emphasize design, analysis, and communication of quantitative tests of hypotheses carried out in the lab and field. Three lectures and one scheduled lab per week.

Course Goals

The emphasis of this course is to provide you with the foundations to observe behaviors reliably, produce creative hypotheses as to the cause of those behaviors, and to develop the appropriate rigor needed to perform behavioral research that is valid and precise. By the end of this course you should:

1. Understand the concepts important to animal behavior studies
2. Explore the ways in which animal behavior research connects across multiple levels of analysis, from genes to ecosystems
3. Improve your scientific literacy through critical analysis of primary literature and first-hand experience with scientific writing
4. Develop the scientific mind necessary to perform behavioral research, from hypothesis generation to presentation of results
5. Develop an appreciation for the importance of animal behavior research in shaping our understanding of the natural world

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Assignments and Grading

The breakdown of your grade is as follows:

Assignment	Date(s)	% Overall Grade
Exams	Oct. 13 & Dec. 8	30
Out-of-Class Quizzes	Sept. 8; Sept. 22; Oct 6; Nov 3; Nov. 17; Dec. 1	10
Paper Discussion	Nov. 17	5
Small Write-ups	rolling	15
Oral Presentation	Oct. 4	10
Annotated Bibliography	Nov. 22	5
Paper Draft Review	Dec. 4 – Dec. 8	5
Final Paper	By Dec. 15	15
Participation Log	Sept. 8; Sept. 22; Oct 6; Nov 3; Nov. 17; Dec. 1	5

This course is graded on a standard grading scale, without a curve applied, in the following manner:

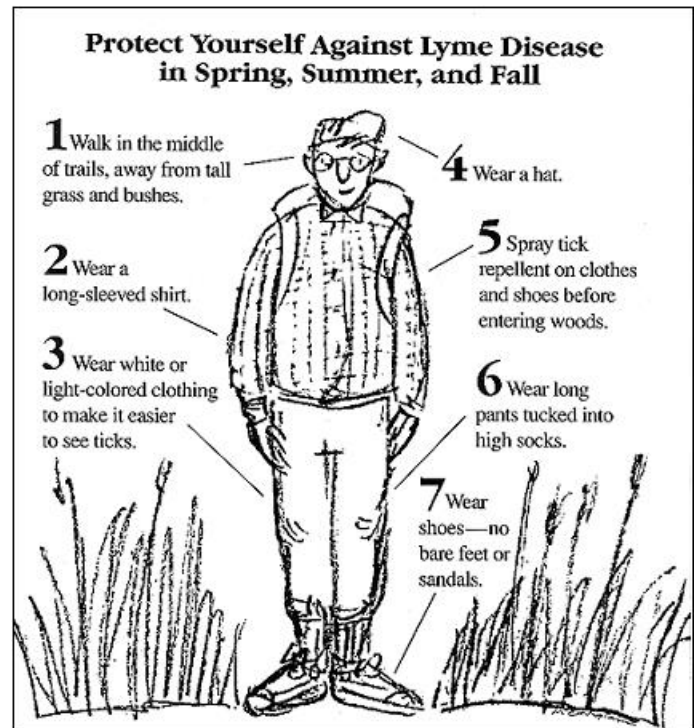
A	Excellent	93-100%
A-	Excellent	90-93%
B+	Good	86-90%
B	Good	83-86%
B-	Good	80-83%
C+	Satisfactory	75-80%
C	Satisfactory	70-75%
D	Passing	60-70%
F	Not yet	<60%

Class Policies

Safety

Part of this course requires you to observe animals in nature and therefore you'll be subjected to some of the hazards of fieldwork. This includes walking through tall grasses and uneven terrain. Let me know if you have any health concerns (allergies, balance issues, etc.) or other limitations and we can work together to make sure you aren't inhibited from any activities. Sometimes field work requires you to sit outside for long periods of time. Make sure you have enough warm, waterproof layers. This includes dressing appropriately for the field (see left).

Because you'll be observing animals in natural areas there is a risk of acquiring parasites. To avoid bites, cover skin, tuck in your clothes and shower and inspect yourself when you get home. You can also apply an insect repellent to clothing.



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Class Policies Cont.

Workload & Late Work

Students are expected to complete weekly readings prior to the beginning of the week. I expect readings to take about 2-4 hours a week, and an equal amount of time for homework/papers. Pay close attention to when major assignments are due, as workload will increase during these periods. Late work will be accepted without penalty if it is delivered to before 11:59pm of the assigned due date. Do not miss class to complete assignments. Any work submitted after the deadline will be accepted for half credit up until the last day of class. Penalty-free extension on major assignments will be given in cases of illness.

Academic Honesty

Each student in this course is expected to abide by the policies outlined in the student handbook on honesty in academic work, found online at [Grinnell Academic Honesty](#). The only assignments in which you'll be allowed to collaborate are for group project experimental design and group presentations. All written assignments, including worksheets, annotated bibliography, and final paper, are expected to be solely your own. If you have questions about how an assignment relates to the College's policy, consult with me in advance of the due date.

Accommodations for students with documented disabilities

I strive to create a fully inclusive classroom, thus I welcome individual students to approach me about distinctive learning needs. In particular, I encourage students with disabilities to have a conversation with me and disclose how our classroom or course activities could impact the disability and what accommodations would be essential to you. You will also need to have a conversation about and provide documentation of your disability to the Coordinator for Disability Resources, John Hirschman, located on the 3rd floor of the Rosenfield Center (x3089).

Technology use in class

I place no restrictions on technology use in lecture and lab. Notes can also be taken on laptops and other hand-held devices, though I caution you to not become stenographers and to interpret and rephrase lecture material to best promote your own retention and learning. For some activities laptops will be required. I will inform you of when they are required and can make accommodations to provide you with a laptop if one is unavailable for you. Laptop use during exams requires notice at least one week in advance.

Religious holidays

Grinnell College offers alternative options to complete academic work for students who observe religious holy days. Please contact me within the first three weeks of the semester if you would like to discuss a specific instance that applies to you.

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Proposed Schedule of Topics

Week	Dates	Topic	Readings	Lab Specifics
1	Aug. 28 - Sept. 1	Methods & Framework	AB: 2.2-2.4 (incl. toolboxes) Osborn & Briffa '17 Bakker & Traniello '16 Traniello & Bakker '17 Levitis et al. '09	
2	Sept. 4 – 8	Evolution	AB: 3 Sih et al. '04	
3	Sept. 11 – 15	Genetics	AB: 4	
4	Sept. 18 – 22	Sensory Systems	AB: 5 Barbero et al. '09 Bayani et al. '17	
5	Sept. 25 – 29	Communication	AB: 6	
6	Oct. 2 – 6	Learning/neuroethology	AB: 7 Akre & Ryan '12 Maák et al. '17	
7	Oct. 9 – 11	Personality	Beekman & Jordan '17 & responses	
7	Oct. 13	EXAM		
8	Oct. 23 – 27	To eat and be eaten	AB: 8.1, 8.2, 8.5, 9 (all)	
9	Oct. 30 – Nov. 3		AB: 10	
10	Nov. 6 – 10		AB: 11 Doligez et al. '02 dos Santos & Peixoto '17	
11	Nov. 13 – 17		AB: 12 Cayuela et al. '17 da Cunha et al. '17 Hosken et al. 16 Edme et al. '16	
12	Nov. 21 – 23		AB: 13 Emlen & Oring '77 Kirkpatrick & Ryan '91	
13	Nov. 27 – Dec. 1	Parental Care	AB: 14 Trivers '74 Sherman '77 / Shields '80	
14	Dec. 4 – 6	Sociality & Cognition	AB: 15 Alem et al. '16 West et al. '07 Diaz-Munoz et al. '14	
14	Dec. 8	EXAM		

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Course Format

As per Grinnell standards, I expect all reading to be completed prior to the first session of said topic. We will spend the beginning of lecture going over the key concepts in the chapter and the rest of the session using case studies, discussions, and active learning activities to dive deeper into the material. Though not all topics from the assigned reading will be reintroduced into the lecture, you will be responsible for all assigned material for the exams. While the lectures will be quite structured, lab activities will be more spontaneous, organic, and creative. To provide some structure to lab I devised a set of assignments to be completed inside and outside lab that teach the basic concepts in animal behavior. Your lab training in doing animal behavior research will culminate in group projects of your creation using the bean beetle as your model organism.

Details of Assignments

Exams

You will have at least 50 minutes to complete your in-class exam. The first exam covers the first seven weeks of material, the second exam covers the second half of the class.

Out-of-Class Quizzes

There are six out of class quizzes and your grade on the top five will be used towards your final grade. Quizzes will be disseminated at the beginning of the week and are due by 11:59pm that Friday. Each quiz will go towards 2% of your final grade.

Paper Discussions

Once during the semester I'll ask you to read and report out on a paper of your choosing within the topic we are discussing. The Monday before the discussion date, you will submit to me the paper you're going to present in class. I will confirm your selection and the following Friday we will have an in-class group discussion in which the major findings, connections to course material, and analytical observations are made about the selected paper. At the end of the discussion, you will fill out the discussion reflection worksheet and your participation in the discussion and responses on the worksheet will go towards your final grade. This discussion participation and write-up is worth 5% of your final grade.

Small Write-ups

Throughout the course there will be small write-ups assigned to train you on the process of performing animal behavior. Both during and outside of class time there will be activities related to these write-ups you need to complete. More details on each of these assignments will be provided to you as they arise. Each assignment will be weighed equally and go towards 15% of your final grade.

Oral Presentation

Each individual will present a paper of their choosing, in the format of a scientific presentation. Oral presentations will take place during the Wednesday lab session. Each presentation will be roughly 10-15 minutes with a few minutes of question/answer sessions per presentation. Grading for the oral presentation will be based on the rubric provided below. More details on this assignment will follow.

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Annotated Bibliography

An annotated bibliography is a list of citations with a descriptive and evaluative paragraph. The purpose of the annotation is to provide the relevance and accuracy of the sources you will include in your paper. A total of 10 references are to be used for your annotated bibliography. This should be mostly primary resources, with justification if including any secondary resources. The citations should be formatted for *Animal Behaviour*. Grading for the annotated bibliography will be based on the rubric provided below.

Paper Draft Review

A draft of your final paper is due December 4th. The draft should be submission ready, meaning properly formatted for submission to *Animal Behaviour* and be complete and well-written. You will submit to me your completed paper. I will then randomly select a paper from another student for you to review. You will review the paper following the guidelines set out by *Animal Behaviour* and submit your reviews to me by Friday, December 8th. You will then receive anonymous comments on your manuscript from another student and incorporate their feedback for the final paper submission, due finals week. To receive full credit for your paper draft review you will need to have submitted your paper draft on time, and provided complete and thorough review of another student's paper. Grading for the review will be based on the rubric provided below and is worth 5% of your total grade.

Final Paper

Your final paper will be due during finals week. This final draft needs to incorporate changes based on your reviewer. You will also include a letter to the editor, in which you outline how you have changed your paper based off comments from the reviewer. Both the paper and your response to reviewer comments will be graded based on the rubric provided below. Final paper must be submitted no later than 5:00pm December 15th.

Participation

You are expected to readily participate in all course discussions, and be present and alert for all class periods. Because participation can be difficult to assess and is often subjective based off your performance in the class, participation will be graded by student written log, the format of which is provided below. Participation logs should be completely by and turned in to me by 11:59pm the Friday that they are due. I will also be keeping track of your participation, and grading of your participation will be based on the completeness and accuracy of at least five of your logs, for a total of 5% of your grade.

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Participation Log

Based off "The participation log: Assessing students' classroom participation" by Tony Docan-Morgan

Due concurrently with out-of-class quizzes, either hard copy or electronically. Respond thoroughly to each of the three prompts. Due by 11:59pm on the Friday that it is due. To receive full credit in participation, five logs need to be completed, with complete answers to all of the following prompts.

Participation in in-class discussions (comments heard by the entire class):

What did you contribute to lecture or large class discussions? Report what you shared specifically and your perception of how, if at all, your contribution aided the flow of the lecture or discussion, as well as the comment's relevance to the lecture or large class discussion.

Participation in small group/dyad activities:

What did you contribute to the dyad, small group, and/or activity? Summarize how you participated, and your perception of how, if at all, your participation aided the interaction.

Self-assessment, reflection, and improvement:

From all the material covered between now and your last assessment, what topic was most salient to you, that you felt you learned the most from. What was it about the topic or the way it was covered that allowed you to understand its content?

From all the material covered between now and your last assessment, what topic covered was the most difficult for you and what about that topic was hard to understand? What could I do differently in teaching that topic that would allow you to understand it better? What could you do differently to increase your learning?

Did you find yourself drifting off or losing focus during class time? What was it about the topic that made you lose focus?

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Discussion Reflection Worksheet

Please fill out and return by the following Monday after the paper discussion session.

1. Which of the discussed papers, besides your own, did you learn the most from? What was it about that topic that was so informative? How did it expand your understanding of the animal behaviors discussed in class?
2. Pick a paper discussed in class and compare it to what was presented in the paper of your selection. How do the two studies relate? What separates the two studies?
3. For any of the behaviors discussed during the paper discussion session, describe the main takeaway from the paper presented and propose a next step for a future study.

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Oral Presentation Rubric			
Category	Excellent (2)	Competent (1)	Needs Work (0)
Scientific Content	Scientific content accurate and appropriate	Scientific content with errors or unrelated	Inaccurate and unrelated scientific content
Scientific Citation	Appropriately cited with scientific merit	Either inappropriately cited or without merit	No citation
Logic & Clarity	Logical, centered around thesis, understandable	Structured, but not fully developed, incomplete, confused or ineffective	Confusing and without structure
Critical Thinking	Interprets and evaluates behavior accurately	Some minor or incomplete critical thinking present	Absent
Aesthetic	Well-formed and appropriate	Distracting or inappropriate	Absent

Annotated Bibliography Rubric*					
Category	Excellent (10)	Good (8)	Fair (5)	Needs Work (3)	Poor (0)
Quality	All sources reliable and content trustworthy	Most sources reliable and trustworthy	Some sources reliable and trustworthy	Few sources reliable and trustworthy	No sources reliable and/or trustworthy
Authority	Authors have good credentials and their work is relevant	You've identified most of the authors, and their work is good and relevant	Only about half your sources have authors with good credentials or relevance	You don't know much about authors and their credentials	You didn't identify your authors or their credentials
Summary	The salient features of the source are summarized, with connections to your study	You mostly summarize your sources and make connections	You summarize your sources but connections to your study are less apparent	Your main ideas are unclear and lack connections to your study	You plagiarize and/or make no attempt at connections
Fluency	All annotations are well-written, thorough, and complete	Most annotations well-written, thorough, and complete	Some annotations well written, but lacking completeness, thought and/or quality	Most annotations lack completeness, thoroughness, and/or quality	All annotations lack quality
Quantity & Formatting	There are 10 citations, formatted for <i>Animal Behaviour</i>	There are a few formatting errors, but still 10 citations	There are some formatting errors and/or missing documents	Frequent errors and missing documents	Lots of errors and missing documents

*Modified from rubrics created by Molly Flaspohler and Owen M. Williamson

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Paper Draft Review

Following the template provided by *Animal Behaviour*

Reviewer 1

Reviewer recommendation (select one):

Reject / Accept without revision / Minor revision / Major revision

Comments to editor (blind to author):

Please place an 'X' next to the most appropriate statement.

	Top	2 nd	3 rd	Bottom
In what quartile of published animal behavior research would you place the scientific value of the study?				
In what quartile of published animal behavior research would you place the presentation of this study?				
In what quartile of published animal behavior research would you place the broad appeal of this study?				
In what quartile of published animal behavior research would you place the statistical rigor of this study?				

Any other comments for the Editor (blind to author)?

Comments to Author (with specific comments and suggestions):

Paper Draft Review Rubric (1 pt. each):

- Paper summarized in short paragraph, showing that you read and understood the work
- Statement of your impression of the work: whether it is novel, interesting, impactful
- Points out if paper adheres to *Animal Behaviour* standards
- Specific comments and suggestions for paper content thorough, accurate, and well thought-out
- Confidential comments to editor complete

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Final Paper Rubric (Based off the rubric found in *Investigations*):

Title

___ Title is informative, specific and precise. 5 points

Abstract

___ The main points of the paper are described clearly and succinctly. 5 points

Introduction

___ Sufficient background has been provided. 5 points

___ A reasonable explanation has been given for why the research was performed, is relevant. 5 points

___ The final paragraph is a brief description of the hypothesis/goals of the paper. 5 points

Materials and Methods

___ Sufficient information is given for the study to be repeated. 5 points

___ The material is organized and logical. 5 points

Results

___ The content is appropriate for a results section. 10 points

___ The results/data are well analyzed. 5 points

___ Figures are appropriate, and properly formatted. 5 points

Discussion

___ Author clearly state whether the results answer the question. 5 points

___ Specific data are cited from the results to support each interpretation. 5 points

___ The author adequately relates the results of the current work to previous research 10 points

References

___ The references are appropriate and cited properly. 5 points

Writing Quality

___ The paper well organized. 10 points

___ The paper is well written. 10 points

___ The paper incorporates reviewer comments appropriately 10 points

Response to Reviewers

___ The author appropriate addresses reviewer comments and explains how the draft has been augmented based on reviewer input. 10 points

120 points total

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Example citations for papers published in *Animal Behaviour*:

In-text citations:

“...based on previous reports (Bailey, Macleay, & Gordon, 2006; Gwynne, 2008; Nityananda & Balakrishnan, 2008).”

“Lung et al. (2002) reported that...”

“for review see Begon, Townsend, & Harper (1996).”

Example Bibliography:

Bailey, W., Macleay, C., & Gordon, T. (2006). Acoustic mimicry and disruptive alternative calling tactics in an Australian bushcricket (Caedicia; Phaneropterinae; Tettigoniidae; Orthoptera): does mating influence male calling tactic? *Physiological Entomology*, 31(3), 201–210.
<http://doi.org/10.1111/j.1365-3032.2006.00501.x>

Begon, M., Townsend, C. R., & Harper, J. L. (1996). *Ecology: From Individuals to Ecosystems*. Oxford, England: Blackwell.

Gwynne, D. T. (2008). Sexual conflict over nuptial gifts in insects. *Annual Review of Entomology*, 53, 83–101. <http://doi.org/10.1146/annurev.ento.53.103106.093423>

Lung, O., Tram, U., Finnerty, C. M., Eipper-Mains, M. a, Kalb, J. M., & Wolfner, M. F. (2002). The *Drosophila melanogaster* seminal fluid protein Acp62F is a protease inhibitor that is toxic upon ectopic expression. *Genetics*, 160(1), 211–24. Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1461949&tool=pmcentrez&rendertype=abstract>

Nityananda, V., & Balakrishnan, R. (2008). Leaders and followers in katydid choruses in the field: call intensity, spacing and consistency. *Animal Behaviour*, 76(3), 723–735.
<http://doi.org/10.1016/j.anbehav.2008.04.015>