

BIOL 469 BEHAVIORAL ECOLOGY

Course Logistics

Location: Zoom (details are on course Sakai site); note that all classes will be recorded and available for asynchronous viewing.

Time: M, W 12-1:15pm

Professor: Dr. Karin Pfennig

Email: kpfennig@unc.edu

Office Hours: Immediately after class

Course Description

This course will examine the influence of natural selection on the evolution of behavior. A cost-benefit approach will be applied to topics ranging from feeding behavior to cultural evolution.

Learning Objectives

By fully engaging with the material and class assignments, you will be able to:

- Explain how an interdisciplinary approach can be used to evaluate how and why animals behave the way that they do.
- List and describe major questions, findings, and approaches in the field of behavioral ecology.
- Critically evaluate and interpret the primary scientific literature.

Course Prerequisites

You must have achieved a passing grade in Biology 201 (Ecology & Evolution).

Course Format

This class will consist of lectures by the instructor and student-led presentations with class Q&A. Students will also be responsible for a semester-long project that will be showcased at the end of the semester. For more details on these presentations and the project, see below.

Professor Availability

In addition to office hours, I am happy to schedule appointments with you to talk about course material, career counseling, or fun science. However, please do not send questions regarding class material over e-mail. Email is inefficient and questions cannot be fully answered. Instead, ask your questions in class—chances are others have the same questions!



In this class, we will explore such topics as (clockwise from upper left): how to avoid being eaten; how to care for young; competing for resources or mates; sexual selection; cooperation; and altruism

Readings

Textbook

Davies, N. B., J. R. Krebs & S. A. West. 2012. *An Introduction to Behavioural Ecology, 4th Edition*. Wiley-Blackwell, Chichester, UK. Reading assignments are on the course schedule, abbreviated as “DKW.”

Required Readings from the Primary Literature

For a number of topics, we will read one to two articles from the primary literature. These readings will reinforce lecture material and will serve as the basis for the student-led presentations (see below). Please note that you will be responsible for any material covered in these readings and discussed in class on exams. The readings are posted on the “Resources” page of our Sakai site.

Student-led Presentations (SLP)

Throughout the semester, there will be student-led presentations of readings from the primary literature. Each student is required to perform one presentation (as part of a team of about 3 people).

Responsibilities of presentation leaders:

When you are presenting:

- Your team should spend ~30-45 minutes at the outset of the presentation providing an overview of the reading material. This must include background (you will need to do background research and reading), links to lecture, and an overview of the paper(s). Tell the class why the material is important and what the central messages of the reading(s) were. **Do not simply summarize—synthesize! You are essentially giving a mini-lecture on the reading assignment.** Each team member must present a different aspect of the paper(s) being discussed.
- After the overview (or as part of it, as appropriate), the remainder of the class period should focus on your classmates’ questions and any discussion of these questions. Note that these questions will be due before the presentation, so that you can incorporate your responses (and any background research needed to answer them) into your presentation.
- Post any presentation materials in a designated thread labelled “discussion summary” on the discussion board forum for your topic. **This must be done no later than 5 pm of the Friday following your discussion. You must also post two possible exam questions based on your materials as a study prompt for your classmates. Note that they might actually appear on an exam!**

Responsibilities of class participants during student-led presentations:

- **Post at least two questions based on each week’s assigned discussion reading on the Sakai discussion board no later than 9 am on the MONDAY before the discussion** (please post your questions on the appropriate discussion forum, which are listed by the topic/date of the discussion). **10% of your final course grade will be based on turning in satisfactory questions each week.**

- Read the material carefully and be prepared to ask additional questions in class. Also be prepared to help answer the questions of your classmates and discuss the implications of the work and/or possible follow up studies.

Semester Project

In small groups (no more than 4 unless exception granted) or individually, students will develop a teaching resource for K-12 education on topics related to the class. This can include (but is not limited to): online videos, podcasts, or lesson plans. These materials should be suitable for local and public dissemination (for example, via YouTube, SciRen (<https://sciren.org/>), or educator resource sites (e.g., <https://www.teacherspayteachers.com/>)).

Students are expected to:

- Identify a topic from class that they want to teach others about.
- Identify their target grade level(s).
- Identify NC state education requirements for those levels that they will satisfy with their project.
- Develop a resource that meets those NC education requirements (preferably for online use); *note that your topic (or targeted grade level) might need to be changed if NC education requirements cannot be met.*
- Obtain outside feedback from teaching or outreach professionals and/or education students.
- Generate a final product that is professional in quality of production and ready to go into a classroom.
- Present the final materials in the class.

Initial proposal:

You will develop a project proposal that includes your topic, target audience, education requirement, planned resource, and actions you will take to develop that resource. On either September 14th or 16th (the class will be divided in half), you will present your proposal to me (and your fellow students for that day) verbally and you will receive feedback. All students will turn in a 1-page synopsis of their projects by **5pm Monday, Sept. 21.**

Project:

You will develop a professional quality resource that can be publicly distributed as described above. It **MUST** be age appropriate under the **most** conservative standards, and it cannot include any obscene, inappropriate, or offensive language, images, etc. You must conform to all copyright laws and the public display of persons depicted in the video, and you must provide credit and attribution for all images, video, text, etc. You may collaborate with students outside class for videography or sound recording, but you **MUST** provide attribution and clearly delineate what was contributed by the outside sources. You may **NOT** pay someone to complete the work, and *all intellectual material must be that of the group.*

For group projects: you must provide a breakdown of all contributions to the project.

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Final presentation:

During the final exam period, we will have a showcase of the final projects. Education professionals will be present, if possible. Each group or individual will present their project with an overview of their goals, target audience, etc. Project grades will be based, in part, on anonymous feedback on the projects.

Exams

There will be two exams. The dates for the exams and exactly which topics each will cover are given on the lecture schedule.

Exams will be based on the lecture material, the assigned readings, and student-led presentations of those readings. Exams will stress concepts, and they may contain multiple-choice, short answer, problem-solving, and essay questions. *There might also be an oral exam component.*

Exams will be administered via Zoom and/or the Sakai site, with a strict time limit for submission. They are open book and open note, but you must work on your own.

If you cannot take an exam at the regularly scheduled time, *you may take the exam early (not late)*. This option is at my discretion, and you must contact me well in advance to set up an alternative exam time(s).

Make-up exams will be given only at my discretion, and only for real emergencies. To be eligible for a make-up exam, you must have an “official” excuse (e.g., a note from the Dean’s office or a physician). Make-up exams may be given as oral exams.

X. Grade Protests

If you think I have erred in grading your exam, please write a brief explanation of the problem, attach the exam, and email it to me.

If you request a re-grade of more than two questions, I reserve the right to re-grade the ENTIRE exam; I also reserve the right to LOWER your score if I erred by assigning too many points.

All re-grade requests MUST be made within 1 week after exams are returned. No re-grades will be made after that time.

XI. Grade Determination

A final weighted total will be calculated based on the scheme below:

Exam 1	15%
Exam 2	15%
Student-led presentation	20%
Final Project & Presentation	40% (see breakdown)
<i>Initial proposal: 10%</i>	
<i>Final product: 20%</i>	
<i>Final presentation: 10%</i>	
Questions for each presentation	10%

Your final class grade will be assigned based on that weighted total as follows:

A weighted score of: **will earn you a grade no lower than:**

93% or above	A
90% to 92.9%	A-
88% to 89.9%	B+
83% to 87.9%	B
80% to 82.9%	B-
78% to 79.9%	C+
73% to 77.9%	C
70% to 72.9%	C-
68% to 69.9%	D+
60% to 67.9%	D

The final cut-offs for each (or all) grade level(s) may be a few points lower than indicated above, based on the performance of the class as a whole and the final distribution of scores.

Final Grade Protests: Once final grades are assigned, they can only be changed in the event that your score was calculated incorrectly. All other grade protests must go to the Dean's office per University policy.

Although I am sympathetic to the issues that students face throughout the semester, I will NOT assign higher grades to students who have lower scores than their peers for ANY reason. There are no opportunities for extra credit, no opportunities to "redo" any of the material, and no way in which I can take "special considerations" into account. Please do not even ask; I will not answer such e-mails, and I will not meet to "discuss your grade."

Additional Guidelines

How to write thoughtful questions about a scientific paper:

1) First, read the material carefully. Make notes in the margins indicating material that is surprising, noteworthy, confusing or seemingly contradictory.

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2) Ask yourself: how might this paper relate to concepts in the lecture? If there are findings that seem inconsistent or paradoxical, formulate questions that try to get at why these inconsistencies or paradoxes may have arisen.

3) Next, focus on the study itself. Are the conclusions that are drawn justified by the results or methods? If the authors had taken a different approach or used a different system, how might things have been different? Formulate questions and comments that get at these issues. However, it is trivial to ask something like “What would have happened if they did a similar study with fish instead of birds” unless you can provide justification for why those groups might differ. If posing such a question, provide a statement of your predictions/expected outcome based upon the textbook, other readings, and lecture. For example, you might state: “I wonder what would have happened if they did a similar study with fish instead of birds. Birds invest more in individual offspring than do many fish, so I would expect that sexual selection would be stronger in the bird system...” Such a statement provides a better opportunity for discussion and debate.

4) At the most basic level, you can ask questions that clarify your reading of the paper. If there was a section that was really confusing, ask questions to help clarify your (and your classmates’) understanding of the material. However, do not simply say something like “Can you explain figure 2?” or “I didn’t get their measure of dimorphism.” Instead make an attempt to express your understanding and express why you find something confusing: e.g., “Figure 2 appears to show a positive relationship between parental investment and offspring growth. However, in the results the authors say they found no relationship between investment and offspring performance, which contradicts Fig. 2. Perhaps I did not understand Fig. 2, but I do not see how the authors made the conclusion they did.”

How to lead a successful presentation:

1) Start with the big picture. Identify the central, key concepts being addressed with the papers. Relate the material in the papers to material covered in lecture—synthesize the material.

2) Provide an overview of what the authors did to test the concepts or questions. Do not get bogged down in detail; everyone has read the paper(s), so do not recapitulate the entire methods section. If, however, the methods were confusing and/or there were many questions about the methods, use your introduction to clear up misunderstandings (e.g., with figures, diagrams, or schematics).

3) After your overview, use answering of the submitted questions to fully address the significance of the paper and how it illustrates or extends material from my lecture on the topic.

4) Let your classmates talk. You do not need to respond to everything that others say; and you might not have all of the answers. Allow the Q&A part of the presentation to form the basis of a class discussion. Although you should be prepared to redirect the conversation if it becomes bogged down on narrow topics or tangents, but don't be too eager to shift topics if the class is confused or really engaged with the material.

5) Be fair to the author's arguments. Present the author's position first before voicing your opinion.

6) Avoid jargon. If it's necessary to use special terms, make sure you define them (a glossary at the start of your presentation is a good idea).

7) Be prepared to support your arguments. The best way to do so is to read the material carefully and do a good job consult additional readings to clarify points made in the assigned reading (please provide these references in your presentation).

How to Succeed in this Class:

1) Attend all classes and *actively* participate as best as you can, given the circumstances. Online class and discussion can be difficult, but we are all in this together.

4) Make connections with your classmates, so you can work together to understand the assigned readings and swap notes. Again, this is hard to do online but do your best. I have set up the chat room function in Sakai to facilitate collaboration. Each student should be able to set up a topic to recruit team members for projects and/or study buddies.

5) Dig deep into one or more topics/systems/approaches that excite you.

6) Help me (and the rest of the class) help you! Bring your questions about the material to class, and if they go unanswered, speak up during the class or talk to me after class.

BIO 469 Lecture Schedule FALL 2020

- Textbook reading assignments (abbreviated DKW) are in parentheses.
- Student presentations are based on articles from the primary literature. These required reading assignments are posted in the “Resources” section on Sakai.
- “Project Work Days; Open Class” are days where I will have the classroom “open” so you can consult with me and your classmates on your semester project. You are expected to work on the project throughout the semester (not just those days). Attendance is optional, but encouraged.

Date	Lecture Topic
Aug. 10	What is Behavioral Ecology? (DKW: Chs. 1 and Ch. 2)
Aug. 12	Hypothesis Testing in Behavioral Ecology (DKW: Ch. 2)
Aug. 17	Natural Selection and Adaptation (DKW: Ch. 1)
Aug. 19	<i>Student Presentation (Hypothesis Testing, Adaptation)</i>
Aug. 24	Project Work Day—NO CLASS (begin sign ups this week)
Aug. 26	Adaptive Feeding Behavior (DKW: Ch. 3; pp 119-131)
Aug. 31	Fighting & Assessment (DKW: pp. 116-119; pp. 397-411)
Sept. 2	<i>Student Presentation (Fighting and Assessment)</i>
Sept. 7	NO CLASS—Labor Day
Sept. 9	Evolution of Cooperation (DKW: Chs. 11 & 12; for extra, not required, reading see also pp. 164-169 and Ch. 13)
Sept. 14	Project Work Day I: verbal proposal due in class
Sept. 16	Project Work Day II: verbal proposal due in class
Sept. 21	<i>Exam Review (1-page project proposal due by 5 pm)</i>
Sept. 23	Exam 1 (covering lecture material, reading assignments, and discussion from Aug. 10 up to and including Sept. 21)
Sept. 28	Communication (DKW: Ch. 14)
Sept. 30	FILM (<i>Cuttlefish: Masters of Disguise</i>)
Oct. 5	Evolution of Sex and Sex Allocation (DKW: Ch. 10)
Oct. 7	<i>Student Presentation (Sex and Sex Allocation)</i>
Oct. 12	Project work day—NO CLASS (independent work)
Oct. 14	Project Work Day; Open class
Oct. 19	Sexual Selection (DKW: Ch. 7)
Oct. 21	<i>Student Presentation (Sexual Selection)</i>

Oct. 26 Mate Choice/Sexual conflict (DKW: Ch. 7)
Oct. 28 *Student Presentation (Mate Choice/Sexual Conflict)*

Nov. 2 Cultural Evolution
Nov. 4 *Student Presentation (Cultural Evolution)*

Nov. 9 **Project Work Day; Open class**
Nov. 11 *Exam Review*

Nov. 16 **Exam 2** (*covering lecture material, reading assignments, and discussion from Sept. 28 up to and including Nov. 11*)

Saturday, Nov. 21, 12-3pm: FINAL EXAM: PROJECT PRESENTATIONS

Please note that unforeseen events may occur during the semester that require a revision to the schedule. In the event of such circumstances, students will be notified of any changes to the schedule as soon as possible.