Instructor: Alexis Will  
Office: 417, Irving 1  
Email: awill4@alaska.edu  
Office hours: by appointment

TA: Kendall Mills  
Office: 244 WRRB  
Email: kkmills@alaska.edu  
Office hours: by appointment

Lecture meeting schedule: Tuesday, Thursday 11:30-12:30, 103 Murie  
Lab meeting schedule: Mon 14:15-17:15 309 Murie

Course goal, objectives and description: Animal Behavior is the study of what animals do. The overall goal of this course is to teach you how to use the scientific method to study animal behavior. The course focuses on the evolutionary approach – specifically, we’ll learn how animals behave (i.e., the proximate, or mechanistic perspective) and why they behave in a certain way (i.e., the ultimate, or evolutionary perspective). Emphasis of the lecture section will be on general concepts, and during the lab section you will learn how to use these concepts in conducting research in the field of animal behavior. Most of written assignments will be assigned as part of the lab section. By the end of the course you will be able to (A) read and critically evaluate primary literature, (B) design and conduct observational and experimental studies, (C) write and present a scientific report.

The course will start with a review of the scientific method. Then, we will focus on the proximate and ultimate causation in behavior as a foundation for the rest of the course. We’ll then move on to the key principles in behavioral research: (1) the interrelated roles of genetics and environment in the development of behavior, (2) the roles of the nervous system in direct control of behavior, and (3) the effects of hormones on behavior. This will take us about half of the way through the course. In the second half of the course we’ll use these general principles to study resource acquisition, defense and use. Specifically, we will study the anti-predatory, foraging, and reproductive behaviors, principles of sexual selection, and the diversity of social systems. During the second half of this oral-intensive course, each student will present a published study on a given subject and lead the discussion of that paper by all students in the class. The course is comparative, and therefore material from a variety of animal taxa will be used to reveal general principles of behavior as well as to illustrate specific behavioral adaptations to particular environments.

Lectures: Lectures may use a variety of media, including computer projection, chalkboard, video clips, and hands-on activities. In some cases, the lectures will follow a flipped format where you will be required to come to class having already reviewed the lecture material (double check Blackboard if you aren’t sure). Note that a substantial amount of what happens in class will not be amenable to being placed on the website (see below), so don’t expect to be able to use notes posted to the website as a replacement for missed lectures. Note also that the exams will emphasize (but not be limited to) material covered in lectures.
Readings: Assigned readings from primary literature provide background and context for lectures and will cover some of the same specific examples that will be used in lectures. Consequently, do the reading prior to the lectures. Material in the assigned readings that isn’t covered in lecture will be fair game for exam questions, but as noted above you can expect the vast majority of exam material to be from what is covered in lecture.

BEHAVIORAL JOURNALS (Primary literature sources)

Below are lists of scientific journals that publish research articles and reviews in animal behavior. The first list includes the behavior-specific journals and the second list includes those journals that are not specifically behavioral in scope but do publish behavioral articles from time to time.


Secondary journals in Animal Behavior: More general journals that frequently publish articles in animal behavior.


Style guides (a sampling):

Supplemental texts or other readings will be placed on the Blackboard.

Blackboard information: We will make use of Blackboard to get information to you regarding homework assignments, scheduling review sessions, modifications to regular office hours, etc. Lecture materials, lecture outlines (after the lecture), lab notes, and old exams will be placed on Blackboard. Please make certain you have access to the Biol 441 Blackboard site. Please check it frequently to be sure you don’t miss something important. You can get access to the website through:

http://classes.uaf.edu

Communication: We will communicate with you regarding revisions of your work through your university e-mail. If this is not your primary e-mail please make sure it is linked to your primary address. This course will require coordinating schedules with us and your fellow classmates, if you have limited internet connectivity off campus please let us know how to get ahold of you.
Tentative COURSE GRADING

You will be evaluated on the basis of your performance on three exams (2 midterms and a final), performance in the lab section of the course, and participation in class.

Midterm 1: Covers **PART 1** of the course
Midterm 2: Covers **PART 2** of the course
Final exam: Focus primarily on the specific STUDIES PRESENTED BY EACH STUDENT IN CLASS, but will also include basic principles of the entire course

Contribution of each part of the course to your final grade will be as follows:

<table>
<thead>
<tr>
<th>Section</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture section</td>
<td></td>
</tr>
<tr>
<td>Exam 1:</td>
<td>10%</td>
</tr>
<tr>
<td>Exam 2:</td>
<td>15%</td>
</tr>
<tr>
<td>Final exam:</td>
<td>15%</td>
</tr>
<tr>
<td>Lab section:</td>
<td>45%</td>
</tr>
<tr>
<td>Class participation</td>
<td>15%</td>
</tr>
</tbody>
</table>

Notes
The course is written and oral intensive, with a capstone research project requirement (see the lab section of syllabus for details), your attendance of lectures and lab sessions is mandatory.

All students who want to use BIO441 as capstone must also register for BIOL F400 Capstone Project (0 credits). The Biology and Wildlife departmental co-chair (Dr. Diane Wagner) is the "instructor" of that course. For more information:
https://www.bw.uaf.edu/undergraduates/capstone.php here you can find links to complete capstone requirements, evaluation forms, and a list of other capstone courses.

Make-up exams will be allowed ONLY for an excused absence with my approval (I will need official verification of illness or family emergency) and will be given in a different format. Exams will test factual knowledge as well as an ability to synthesize and integrate information. The first Midterm will be a take-home and will require you to apply the concepts covered in the first few weeks of the course. Midterm II and the Final will consist of short to medium length written answers (i.e. a few sentences to a paragraph). Examples of each exam (questions with answers) will be discussed before the midterms and final. Midterm II and the Final will not be comprehensive, but could include questions from previous examination(s).

Class participation – Learning occurs when you are doing/teaching/participating with the lecture material. Short assignments, hands-on activities, and formal discussions will be part of your class participation grade. Come to lecture prepared to be engaged and actively learning.

If you would like to request academic accommodations due to a disability, please contact Disabled Student Services, 474-7043. If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to us so we can discuss the accommodations you might need for class.

UAF Honor Code – everybody should be in good standing

Grading: Final grades will be assigned based on percentages of total points earned:

\[
90-100\% = A; \quad 80-89\% = B; \quad 70-79\% = C; \quad 60-69\% = D; \quad F<60\%.\n\]

At their discretion, the instructors may reduce one or more of these percentages when assigning final grades.
Biol 441: Animal Behavior LAB

General

- Goals (A) Broad: to learn how research is conducted in the field of animal behavior. (B) Specific: to learn how to design, conduct and present your own study on a topic in animal behavior. Rather than learn from ‘canned’ labs, you will conduct studies that YOU’VE designed, and learn how to analyze and present the data in both oral and written formats. This class is a writing/oral-intensive class, which means that most of your graded work will be written and presented. You will have the opportunity to revise drafts and improve most of your writing assignments. Scientific writing and presentation can be difficult and time-consuming, but the ability to write good scientific papers and effectively communicate results is essential for a biologist. By the end of this semester, you should be able to both conduct research of your own, and to intelligently critique any other studies or papers you come across. You will get as much feedback on drafts of papers as you care to ask for – we are much more interested in seeing writing improvement than in taking off points.

- All animals, vertebrate and invertebrate, must be treated with care and respect. Furthermore, may be required to enroll in and complete the online University IACUC (Institutional Animal Care and Use Committee) module.

<table>
<thead>
<tr>
<th>STUDENT RESPONSIBILITIES</th>
<th>Early-semester: intro</th>
<th>Mid-semester: practice</th>
<th>Late-semester: demonstration of expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive Writing</td>
<td>Lab reports</td>
<td>Group paper</td>
<td>Proposal of final project</td>
</tr>
<tr>
<td>Intensive Speaking</td>
<td>Presentations of group project</td>
<td>Presentations of papers (lecture section)</td>
<td>Presentation of final project</td>
</tr>
</tbody>
</table>
Assignments

- **Late assignments:** 10% of the points will be docked for every day an assignment is late, and you will get **no credit** if it is not in by the Friday after it is due. Let me know if you have extenuating circumstances-- please talk to me by the Friday before the due date.

- **ALL ASSIGNMENTS:**
  - Will be submitted in one (1) document – either a .doc or .docx.
  - Name of the document will begin with the student’s surname, first initial, and an underscore (e.g. MillsK_lab report1.doc)
  - Must be typed (Times New Roman - 12pt font OR Calibri – 11pt font, double-spaced). Spelling and grammar are important, and some points will usually be dedicated to organization and clarity.
  - Always due at the beginning of the following lab, unless otherwise indicated.
  - Emailing assignments to your TA (kkmills@alaska.edu ← use this email address!) is the preferable way to turn things in, as long as they are on time (Before lab!)

- **LAB REPORTS**
  - Lab reports will follow the scientific method. Sections will be as follows:
    - **Introduction:** why are we doing this project? What questions are we addressing?
    - **Methods:** What exactly did we do
    - **Results:** What did we find. This is the place to embed graphs you may have made.
    - **Discussion:** Re-address the questions from the introduction with the information you’ve learned from our time in lab.
    - **Questions:** There will be questions laid out in the lab handout. Please number these as they are numbered in the lab handout and answer them fully (1-2 good sentences).
Grading

Although your lab grade will be integrated into your lecture grade, we will score it out of 100 possible points.

- 10% Participation (on time? carrying your weight? contributing ideas?)
- 20% Betta fish paper (group project: group paper)
- 30% Independent project proposal preparation
  - Developing a project worksheet (5%)
  - Presenting your study plan to classmates (5%)
  - Final proposal (20%)
- 10% Independent project poster
- 10% Independent project poster presentation
  - NOTE: THERE IS NO FINAL PAPER ASSOCIATED WITH THE FINAL PROJECT. Your Independent Research Project Proposal, IACUC modifications, and Independent Project Poster ARE THE WRITTEN COMPONENTS OF THIS ASSIGNMENT.
- 20% Other assignments (paper reviews, drafts of proposals, etc)

Note that papers and presentations are worth a lot, but you should have plenty of time to revise and get enough feedback to perfect the final product! USE YOUR TA (in a nice way, please). I will comment on drafts as long as I get them by the Wednesday prior to the lab in which they are due.

- For most assignments, I will provide a general outline of how the points are allocated. Look carefully at these! Sometimes things that might seem trivial (like including references) can be very heavily weighted.
- The “do your own work” policy that you usually hear about applies here, but it’s tricky because you will be working closely with your group members and handing in group assignments. However, people in the same group may receive different grades if it is clearly established that some did more work than others. To help keep track, other group members will evaluate your contribution to the project and you will be asked to submit a report, recording what you did and how much time you spent. I will check in periodically to make sure everyone feels that the work is distributed evenly across group members. Please make an appointment to talk to me if you have concerns about group dynamics.
- Absences: It is a bad idea to miss lab. Don’t do it if you can help it, and talk to me first if you can’t help it. You may not be able to make up assignments missed because you did not attend lab.

Capstone Requirements
- Students must pass the project itself (adequate or better on all items on the evaluation form) in order to complete the capstone requirement (i.e. 70% or greater on the independent research project portion of the lab).

- Students who do not pass or do not finish the project within the semester will receive a DF (deferred) grade for BIOL 400, and may continue that project or pursue a new one in semesters to come.
LAB SCHEDULE

Week 1 (Aug 26): Introduction to Animal Behavior
  • Field Observations: group size and vigilance
  • Analyze data
  Assignment – Find 2 betta papers to discuss with group

Week 2 (Sept 2 Labor Day – no classes)

Week 3 (Sept 9): Creamer’s Field
  • Field Observations: group size and vigilance
  • Analyze data
  Due – 2 betta papers (with summary)
  Assignment – Creamer’s Lab Report

Week 4 (Sept 16): Betta Observation Lab
  • Betta experiment (short)
  Prepare for Group Betta Project
  • Review of previous Betta projects
  • Discuss Betta papers in groups
  • Define study question, experimental design
  Due – Creamer’s Lab Report
  Assignment – Betta Lab Report; 1-2 p. proposal with DETAILED methods and timeline

Week 5 (Sept 23): Group Betta Experiment *(no regular lab meeting)*
  • test feasibility, hardware
  • collect pilot data
  • reassess questions
  • collect more data
  Due – Betta Lab Report; Group Proposal
  Assignment – Draft of introduction and methods

Week 6 (Sept 30): Betta Data Lab: Stats, figures and presentation
  • Work up data on computers
  • Create figures/tables for report
  • Present results to class/discuss as a class
  • Outline discussion
  Due – Draft of intro & methods
  Assignment – Draft of results and discussion

Week 7 (Oct 7): Individual project development
  • potential projects overview
  • assess literature
  • review elements of experimental design
  • assess local resources
Due – Draft of results & discussion  
Assignment – Final draft of Betta paper, Project Development Worksheet (3 key references)

Week 8 (Oct 14): Proposal writing workshop  
Due – Final Group Betta Paper; Project Development Worksheet (including 3 key references)  
Assignment – Proposal Draft

Week 9 (Oct 21): Independent project proposal presentations (Part 1)  
- Present your project to lab  
- Take notes of and use labmates’ constructive critiques to improve your proposal  
Due – Proposal Draft  
Assignment – Proposal Final (modified in response to comments from labmates); IACUC Training and Application for IACUC Approval of Your Project

Week 10 (Oct 28): Independent project Start  
- Meet with instructors to fine-tune project methods  
Due – Proposal Final; IACUC Application in review  
Assignment – Project Data Collection, contingent on IACUC approval of your proposal

Week 11 (Nov 4): Conduct independent Projects. (**No scheduled lab**)  
Due – Nothing  
Assignment – Be prepared to bring data to next lab

Week 12 (Nov 11): Data analysis  
- Analyze your data and prepare results  
Due – Project data  
Assignment – Study summary; complete project data analysis

Week 13 (Nov 18): Poster making tutorial  
- How to make a scientific poster & why  
Due – Study Summary; Data Report  
Assignment – Draft of Poster

Week 14 (Nov 25): In class poster exchange  
- In-class poster exchange and critical reading  
- Critiques will be graded!  
- Meet with instructors for writing feedback  
Due: Poster Draft  
Assignment: Final poster

Week 15 (Dec 2): Poster session!

Good luck on the final!