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 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 the sexual selection, and 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, and video clips. 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 it will help if you do the reading prior to the lectures. Material in the assigned text 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.
TEXTS:


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 may 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 notes, 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

By now, you should be able to obtain this document (General Course Information) and the syllabus with projected lecture and reading schedules from it right away. Lecture outlines will also be posted to the Blackboard, but generally not until after a given lecture. As noted above, these will not be so detailed as to be useful as replacements for missed lectures.
**Tentative COURSE GRADING**

You will be evaluated on the basis of your performance on three exams (2 midterms and a final), 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>
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<tr>
<td>Final exam:</td>
<td>20%</td>
</tr>
<tr>
<td>Lab section:</td>
<td>45%</td>
</tr>
<tr>
<td>Class participation:</td>
<td>10%</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 chair (Dr. Diane Wagner) is the "instructor" of that course. Where to find more information (B&W/Undergraduates/Capstone):

[https://www.bw.uaf.edu/undergraduates/capstone.php](https://www.bw.uaf.edu/undergraduates/capstone.php) On that page 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 they will be given in a different format. Exams will test factual knowledge as well as an ability to synthesize and integrate information. The exams will consist of short answers (one to a few sentences). Examples of each exam (questions with answers) will be handed out before the midterms and final. Midterm II and Final will **not** be comprehensive, but could include questions from previous examination(s).

Class participation - your questions and comments are appreciated in lectures and labs. There will be short formal discussions (lead by instructors and students) in several lecture and lab periods. You should prepare (e.g. write down) any questions you have while doing the assigned readings, and see that your questions are addressed in class.

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**
- **80-89% = B**
- **70-79% = C**
- **60-69% = D**
- **F<60%**. At their discretion, the instructors may reduce one or more of these percentages when assigning final grades.
General

- Goals: To learn (A) General: how research is conducted in the field of animal behavior. (B) Specific: 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. WillA_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 (akwenninger@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 worksheet (5%)
  - Presenting your study plan to class mates (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.
- USRA funding: This year URSA is making funds available for equipment and supplies that will benefit BIO441 capstone student projects. URSA's generous funding comes with the strong request that students share their work (present a poster) at Research Day gathering (late April of each year).
LAB SCHEDULE

Week 1 (Aug 29): Introduction to Animal Behavior
  Due – nothing!
  Assignment – Find 2 betta papers to discuss with group

Week 2 (Sept 12): Creamer’s Field
  - Reading literature
  - Collecting animal behavior data
    • Field Observations: group size and vigilance
    • Analyze data
  Due – 2 betta papers
  Assignment – Creamer’s Lab Report

Week 3 (Sept 19): Betta Observation Lab
  - Betta observations (ethogram) & potential questions
    • Paper (primary literature you found earlier) discussions in groups
    • Review of previous BIO441 projects
    • Define study question
  Due – Creamer’s Lab Report
  Assignment – Betta Lab Report; 1-2 p. proposal with DETAILED methods and timeline

Week 4 (Sept 26): 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 5 (Oct 3): Betta Data Lab: Stats, figures and presentation
  • Work up data on computers
  Due – Draft of intro & methods
  Assignment – Draft of results and discussion

Week 6 (Oct 10): Individual project development
  • Assess literature
  • Review elements of experimental design
  • Assess local resources
  Due – Draft of results & discussion
  Assignment – Final draft of Betta paper, Project Development Worksheet (including 3 key references)

Week 7 (Oct 17): Proposal writing workshop
  Due – Final Group Betta Paper; Project Development Worksheet (including 3 key references)
Assignment – Proposal Draft

**Week 8 (Oct 24): 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 9 (Oct 31): 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 10 (Nov 7): Conduct independent Projects. (**No scheduled lab)**
Due – Nothing
Assignment – Be prepared to bring data to next lab

**Week 11 (Nov 14): Data analysis**
- Analyze your data and prepare results

Due – Project data
Assignment – Study summary; complete project data analysis

**Week 12 (Nov 21): Poster making tutorial**
- How to make a scientific poster & why

Due – Study Summary; Data Report
Assignment – Draft of Poster

**Week 13 (Nov 28): 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 14 (Dec 5): Poster session!**

*Good luck on the final!*