Animal Behavior: Spring quarter, 2007
First Day Handout

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Program website: http://academic.evergreen.edu/curricular/animalbehavior/
Familiarize yourself with the website, and get in the habit of checking the announcements page for, well, announcements.

Prerequisites: Junior or senior standing. At least one year of college-level biology, one year of college-level writing, and background in evolutionary and ecological theory.

If you do not have background in evolutionary or ecological theory, but otherwise feel prepared for this program, you must read chapters 1, 2, 4, 6 and 7 in Evolutionary Ecology (by Pianka, an optional text available at the bookstore), plus the first paper in the coursepack (Platt 1964), immediately. I will not be explicitly teaching the scientific method or basic evolutionary or ecological concepts, so if you are unsure on these issues, consider another program.

Credit: 16-units of upper-division science credit will be awarded in animal behavior, evolution, ecology, zoology, and biological statistics. Lower-division work will be awarded lower-division credit.

Overview and Cautions:

This program will examine what animals do, how they accomplish these tasks, and why they do them. Focus will be on "why" kinds of questions: Why do antelope live in groups? Why are so many birds monogamous? Why do many ants, bees and wasps forego reproduction? Why do male moose have big antlers? Why does infanticide persist in lions and langur monkeys? Why do frogs call?

To answer these sorts of questions, you must probe into ecological and evolutionary logic, and so we will. You will be expected to engage some of the complex and often contradictory scientific predictions and results that have been generated in this field. You will likely have an emotional reaction to some of this material, but you will be expected to assess data and theory alike scientifically. We will focus on social behavior, with topics including mating systems, territoriality, competition, communication, parental care, mate choice, plant/animal interactions, parasitism, mutualisms, and convergent evolution.

Some of our readings will be on one particular animal species, *Homo sapiens*. If you have moral, religious, or other objections to the inclusion of humans in the group *Animalia*, whose behavior can be understood with many of the same tools that we use to understand other animals, you should find another program.

Finally, to truly understand what animals are doing, you must go out and watch them. Thus, for your independent research projects, you must spend at least nine days in the field over several weeks, in order to collect enough data to actually garner "a feeling for the organism," as Barbara McClintock (corn geneticist and Nobel laureate) once said. This means at least four full days of program-related work, each week, for several weeks during the quarter. If you won't be able to do that, find another program.

Weekly Schedule (Beware: There are exceptions to these standard times! See syllabus (handouts 2 & 3) for full schedule.)

Mondays	**Tuesdays**	**Thursdays**
Am: discussion/research workshop 9 – 11 am: ***Sem II D3109***	Am: lecture / film 9 am – noon: ***Sem II D2109***	Weeks 1 - 4: field trips Weeks 5 - 9: independent research
Pm: lecture Noon – 3 pm: ***Sem II D3109***	Pm: Statistics workshop 1:00–3:00 pm: ***CAL East***	Week 10: potluck in pm

Texts and Other Required Purchases and Expenses

- An Introduction to Behavioural Ecology (3rd ed). By J. R. Krebs and N. B. Davies. 1993. Blackwell Science, Inc. 420 pp. ISBN: 0632035463
- Measuring Behavior: An Introductory Guide. By P. Martin and P. Bateson. 1994. Cambridge University Press, New York. ISBN 0-521-44614-7
- Practical Statistics for Field Biology, 2nd edition. 1998. By Jim Fowler, Lou Cohen & Phil Jarvis. Published by Wiley & Sons. ISBN: 0-471-98296-2.
- Animal Behavior Coursepack. Includes several articles from the primary literature which will add significantly to your ability to integrate theory with data in animal behavior. Available from me. $25 each (my cost).
- Rite-N-The-Rain notebook(s), for data and observations during our group field trips, and for collecting data during your independent projects.
- Digital watch with stopwatch/timer capabilities.
- $57 submitted to the Cashier, into your student account (take your A#), for field trips.
- Any additional expenses associated with your independent research project. Some equipment may be available on loan from LabStores, but do not count on it.

Optional (but recommended) Texts and other equipment

- Evolutionary Ecology (6th ed.). By Eric Pianka. 1999. Addison-Wesley. 512 pp.
- Field guides for the organism(s) you're working on for your independent research
- Binoculars, preferably water-resistant, at least 8x.

Readings

There are a lot of assignments, including substantial readings from the primary literature. You are all adults. I expect you to figure out when you already know something (and can therefore skim a section), and when you aren't getting it (and need to go back and reread).

Take-home Exams

There will be three take-home exams during the quarter, based mostly on lectures and readings; these will take the form of short essays. You will be expected to work alone on these, but may use any other non-human resources at your disposal.

"Study questions"

Assigned many weeks, the "study questions" are also designed to help you synthesize and integrate your understanding. Your written answers to the study questions are due in class the following Monday, when you will be discussing your answers in small groups, then all together as a class. You are encouraged to work collaboratively on these assignments.

Independent Research Projects

You're not just going to be sitting inside reading books and talking this quarter. You are going to actually do some empirical science, a project which you will imagine, research, design, implement, analyze, interpret, and present, from start to finish. For now, a few notes on those words, carefully chosen:

1. **Imagine**: What are you interested in? Are you driven to study a particular organism (e.g. the pileated woodpecker)? Or a particular question (e.g. seasonal territoriality)? Figure it out, and pick a topic. Specifically—what is your hypothesis? What question are you trying to answer?
2. **Research**: Now that you have a topic, what is known about it already? You will be producing a scientific paper at the end of this, which requires a "literature review" of the topic that you have done research on. Your library research will likely be ongoing as you discover new things about the system you are studying, but before you begin field work, you should be able to write an outline of the Introduction section (barring unforeseen changes in your topic as you embark on field work). You will save time and frustration if you plan to go to UW's library to conduct some of this research.
3. **Design**: Now that you know a fair bit about what has already been done on your topic, hone your hypothesis (or hypotheses). Come up with as many alternative hypotheses as you can to explain the pattern, or question, that you are trying to answer. Derive the predictions that follow from those hypotheses. Now figure out what test (be it experimental or purely observational) would enable you to distinguish between the hypotheses. Can you implement this test? Is it feasible and practical? If yes, you're ready for the next step.
4. **Implement**: The field work. You've got a set of hypotheses, you know what there is to know about your topic, you've designed a test to answer your question—now get out there and start collecting data! Be prepared for roadblocks, and for nothing to be done as quickly as you were hoping for.
5. **Analyze**: Once you've got all of your data, you need to do something with it. This will involve statistical analysis. We will have seven stats workshops to familiarize you both with the power and meaning of statistics, and with two relatively user-friendly programs (Excel and Kaleidagraph).
6. **Interpret**: You've got analyzed results, but what do they mean? How do they fit into the context of what is already known about this system? About these sorts of questions generally? About animal behavior at large? What has your study added to our knowledge? Is it another brick in the wall of knowledge (as most research is), or have you discovered something truly new and different? What is the most exciting (yet rigorous and honest) meaning that your data could have? This is where you tie theory together with your data, and you make them sing.
7. **Present**: Everyone will both give a research talk on their work, during a TESC Animal Behavior mini-conference, and write a scholarly paper on that work.

Lecture

It is my hope that lectures will involve a lot of back-and-forth and questions. You don't want me to just talk at you for several hours each week, and neither do I. Some lectures will include workshops, to help you wrestle with the ideas in a different format. Attendance is required at all lectures, and you are expected to do the reading before showing up. I will rarely reiterate material from the readings during lecture, as that seems like a waste of all of our time, so I will assume that you are familiar with the reading material, and will build on concepts found in the text during lecture.

Statistics Workshops

We will have weekly, 2 hour statistic workshops that will introduce you to the power and limitations of statistics, their particular application in behavioral research, and the use of Excel and Kaleidagraph. Some weeks you will have work to turn in from these workshops, but much of your statistical learning will be put to the test when you analyze your own data.

Animal presentations

On the first day of class, you will sign up for a local organism. On the following Monday, each one of you will give a 5 minute PowerPoint presentation on that animal: what is it (e.g. rodent, damselfly, bird), where is it found (and with what other organisms), and what does it do (its life history and ecology). You are expected to use at least three sources from the primary literature to put together this report, but there are also two very good animal diversity websites that can help you focus your attention; these are on the "Resources" page on the program website. While you are putting together these presentations, you must also make an annotated bibliography of your sources: the full citation for the source, and (briefly) what you learned from that source.

Field Trips

As a class, there will be three day trips, and one three-day field trip. The schedule is:

April 5: Woodland Park Zoo

April 12: Nisqually Wildlife Refuge

April 17-19: Columbia River Gorge vicinity

April 26: Gray's Harbor bird migration

Student Evaluations will be based on:

- All aspects of your independent research project
- Performance on each of three take-home exams
- Written responses to, and participation in class discussion of, study questions
- "Animal presentation" and your annotated bibliography
- Statistics workshops
- Attendance at and timeliness in all aspects of the program, including field trips
- Engagement with the material during lectures, workshops, and other class activities, and willingness to help others learn

The quality of your work, level of understanding, effort, and extent of improvement will all be important in your evaluation.