

BIO 45 - ANIMAL BEHAVIOR - COURSE PROSPECTUS - Fall 2002

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This handout contains the philosophy, goals, structure and procedures of the course. Since the course has a fairly complex structure, you should re-examine this prospectus from time to time. Be sure to visit the web page too: [www.brown.edu/Courses/Bio_ /](http://www.brown.edu/Courses/Bio_)

I. About The Course

Animal behavior is a user-friendly subject. The fascinating ways animals behave should motivate your curiosity and imagination. Trying to figure out how and why they do what they do should drive your desire to learn and practice the basics of behavior research. Lectures, readings, and films will provide the factual, conceptual and methodological framework for turning your curiosity into a scientific study of animal behavior. Journal assignments and discussions will let you to do science while you are learning how it works.

The conceptual core of the course is an evolutionary approach that has been particularly effective in revealing and offering explanations for complex behavior. This evolutionary approach is known as behavioral ecology. The behavioral ecology 'way of thinking' is young enough to be ripe with change and internal controversy. Focusing on behavioral ecology allows me to show you how shifts in the way we think about behavior can reveal previously hidden explanations. Although our focus will be on the function of behavior, we will also look at some of the underlying mechanisms involved. More details on behavioral mechanisms can be found in your text and in neurobiology and psychology courses (e.g., Psych 50).

Behavioral ecologists face some clear challenges: How can ideas about evolution be tested in short time periods? How can carefully controlled experiments be done under natural conditions? How do the results of laboratory experiments relate to natural conditions? You will learn some basic "tools" for meeting these challenges under laboratory and field conditions. While you are doing this, you will be interacting directly with the process -- observing and thinking about animals behaving. Bio 45 is primarily about what animals are doing and how they got that way. The more that you observe and think about the behavior of animals you encounter the better.

Our evolutionary focus will involve four central questions:

- 1) How does behavior solve basic problems of survival and reproduction?
- 2) How are behaviors shaped by the developmental, ecological and social environments in which they occur?
- 3) Can we develop and test general rules or models of how animals most likely to behave?
- 4) How can we do all this scientifically?

Bio 45 is designed to help you to develop your skills in critical thinking and in reading and evaluating original scientific literature. You will see how biases (factual, historical, conceptual and sexual) enter into the way science is done; and you will learn how scientists deal with these biases. You will learn to take advantage of your own imagination and the insights that are gained by shifting your perspective between different views of behavior: proximate versus ultimate cause, lab versus field studies, and male versus female perspectives.

Our exploration of behavioral ecology will emphasize the basic process of doing science -- generating ideas and testing them. You are going to be directly involved in this process for the entire course. That will take a lot of time and effort, but the rewards are clearly worth it. I cannot emphasize enough that this is not a course where I teach you some things about behavior. It is a course where, if you become directly involved, you will acquire knowledge, develop skills and broaden your perspectives.

I have designed this course around a particular view of science and science education:

- A. Rather than obtaining a solid background in facts and methodology before students start doing science on their own, I feel they should start doing science while accumulating the factual and procedural background. That is not to say that facts and vocabulary are not necessary -- they are absolutely essential. However, they make more sense and are retained better if you start using them and discovering some of them yourself. You need to accept that what you do at first may not be all that sophisticated. If you are reluctant to participate in the process given your "lack of background", I hope to change your mind.

We will focus on a conceptual background to and formalization of a process of exploration that you already know. You should expect to get confused about some things. This confusion is good if it makes you think, talk with others about your ideas and watch animals more closely.

- B. Science (like all human endeavor) cannot be totally objective (free of bias). That bias comes from your gender, your culture, your experience with biology, and your personal value system. How we view the causal connections among things depends on our perspective. A good scientist must come to grips with how to recognize and deal with bias. Those who can look or think from several perspectives usually get further than those who are locked into just one perspective. In this course we will look at how a variety of different perspectives can influence what we see and how we think. You are invited, in class, your journal and discussions to consider additional changes that might result from other perspectives.
- C. Biology is often taught as a set of disciplines (genetics, morphology, biochemistry, cell biology, etc.) that reflect “levels of organization” with chemicals at one end cells and organisms sort of in the middle and ecosystems at the other end. These are historical and conceptual artifacts, invented to deal with the complexity of biology. Life is a good deal less orderly! Learning to deal with that non-linearity and complexity is essential!

Consider that an animal’s behavior is a result of that animal’s design, its experience, and the designs and experiences of all of the other organisms it interacts with; plus non-biological processes that influence these designs and experiences. Each design is the result of historical interactions of the previous designs and experiences of ancestors of those animals. How can this be a linear process? How do we deal with this complexity? We’ll make a start.

- D. Science does not follow a simple “true/false” path to the answer. Rarely is “it is either A or B” true in science and especially in holistic fields like behavioral ecology and evolutionary biology. Usually the answer is: “Whether it is A, B, both, or neither depends on...”. We live in an age where there is a vast amount of information to and the more we learn, the less obvious everything gets. I will present animal behavior as a slowly evolving understanding of how little we know about the real world. I encourage an objective and skeptical (but not cynical) attitude toward the basic 'way of thinking' presented in the course.

By now you may be thinking, “This is like several courses rolled into one and that means it is likely to get pretty messy and involve a lot of work on my part.” You are correct and should consider whether or not you have the time or desire to sort it all out this semester.

II. Dealing with the complexity of the Course

You will get more from the course if you are an interactive learner rather than a passive observer and memorizer. It is essential that you be seriously involved in your journal (see below) and take an active part in discussion sections (in class and on the Web-Discussion). In addition, I urge you to visit the Bio 45 web site frequently. It contains course news, lecture notes, clarification of issues raised in lecture and section, previous exams, and other web sites dealing with animal behavior. Take advantage of these ways to interact and share your ideas with others.

Above all, it is imperative that you observe and think about the behavior of animals around you all the time. Animal behavior cannot be learned from books and lectures. Your journal is an open door to watching animals and to thinking and it is your best way to interact one-on-one with those of us teaching the course. Put a lot of effort into your journal and you will more than double what you get out of this course! A separate handout provides details on the journal exercises.

Alcock's textbook is the source of most of the factual and conceptual detail in the course. My lectures will depart from the text to provide additional perspectives and information. I will always assume you have done the assigned reading before the lecture. You should read some of papers cited in Alcock -- don't get all your information second and third hand! Take study breaks to browse the following journals on A-level (current issues) : Animal Behaviour (QL750 A7), Behaviour (QL750 B6), Behavioral Ecology (QL750 B534), Behavioral Ecology and Sociobiology (QL750 B533), Ethology (BF3 Z49), and Trends in Ecology and Evolution (1-SIZE QH540 .T73x). These journals can be accessed via the web through the Brown Electronic Journals page at -www.brown.edu/Facilities/University_Library/eresources/ejournals/alpha.html

III. Course Structure: What The Various Parts are Designed to Do

Your ability to integrate the various elements of the course means you must know basic facts, vocabulary and concepts. You should know which ideas belong to whom and how they have been or could be tested. You also need to produce and play with your own ideas and you need to acquire a lot of

first-hand information about animals and their behavior. Films, discussions, journals, and watching lots of animals will help you do this -- if you put in the time. Here are some details:

A. Discussion sections and films:

Section (see reading list) is a forum for the mutual exchange of ideas and information directly and indirectly related to lectures and readings. A week in advance, you will get a handout that will outline the discussion topic, assign readings and describe what is expected of you. The section topics will range among 1) general discussions of readings and lectures, 2) observations and discussions of films, and 3) evaluations of published papers.

Active participation by all is vital to the success of discussions and to your success in the course. **We will not give you a grade for the discussion section. However, failure to attend and participate regularly in all discussions will result in an NC no matter what your exam grades are.** If you are shy or have trouble getting into discussions, let your teaching assistant know and we will help you work on it. **If you do not participate actively in the section discussion we expect you to do so via the Web Discussion group** (see below). Share your ideas and try not to dominate sections. Encourage others to participate - you are not competing for anything. You should not miss any sections. Doing so puts you in jeopardy of an NC.

B. Course journal and exercises:

The main vehicle for interactive learning in this course is your journal. Your writings, spontaneous and in relation to assigned exercises, will help you integrate parts of the course (observing animal behavior, doing science, exploring ideas, and dealing with bias). The journal contains your observations on animal behavior and on your own thinking. A separate handout describes the structure of this journal and the exercises it will include during the course. **We expect that you will put in a minimum of four hours a week on your journal (doing observations and brainstorming).**

Each journal exercise will be graded (50 of 200 points in the course) on two basic points: 1) whether it was on time and complete and 2) whether you put in the minimum required effort. In addition, I will use my estimate of your effort and progress in the journal as a means of deciding whether to raise or lower your grade based on exam scores.

C. Texts and readings:

Your text and the lecture and discussion section handouts are the core of the readings for the course. I will also assign readings from major animal behavior journals. These will be available to you as pdf files or via the internet in Brown's electronic library holdings. Expect up to 150 pages of reading per week. Expect to be lost in lectures if you do not keep up with the readings. Read them carefully before the lecture.

The readings assigned from electronic journals in the library will be given as a journal reference. You will have to find them and download a copy on your own. The purpose of having you go get the article is to give you a chance to explore other articles in the same journal. Required Texts:

1. Alcock, J. 2001. Animal Behavior: an evolutionary approach (**7th Ed**) Sinauer Assoc.

D. Bio 45 Web Site and electronic discussion

Two other essential parts of this course are the web and discussion sites. Look through them before the end of the first week of class. Please help each other gain access to these sites.

The **Web Site** is THE place to find important announcements, class handouts and assignments, problems to explore, hints for getting the most from your journal, clarification of lectures, copies of previous exams and study guides, and links to other sites that deal with animal behavior. The (electronic) **Web Discussion** site will allow you to pose and help each other answer questions about the course and the material we cover -- as you did in Bio 20. The web site is always under construction and I welcome suggestions for improving it

E. Exams and grades:

Science is largely a game of discovering and explaining things and then convincing others that you have. The same applies to the exams.

There are 3 hour exams -- no make-up exams - plan ahead!!

Exam 1 -- Wed., Oct. 2 -- in class

Exam 2 -- Wed., Nov. 6 -- in class

Exam 3 -- Wed., Dec. 11 -- in class **Note that this is the day before Final Exams start - Avoid conflicts!!!

Since knowledge acquired in early parts of the course is used later, the exams should be considered cumulative. The exams are a mixture of short answer and short essay questions. One or more of the exams may include a take-home essay.

Grades are based on exams, participation in discussion sections and progress in your journal. An "A" reflects an outstanding grasp of the conceptual and factual course material and the ability to work creatively and critically with it. It also requires active and valuable participation in discussions and considerable effort in your journal -- e.g., well beyond the minimal requirements). A "B" reflects good to very good understanding of the material and an ability to work synthetically with it (plus consistent effort in discussions and your journal). A "C" reflects an adequate understanding of the course material and at least occasional participation in discussion and the minimal required effort in the journal. I interpret an "NC" to include both "D" (poor) and "NC" (failure). **Consistently scoring below 50 points (out of 100) on exams, lack of participation in discussion, and minimal effort on journal exercises are likely to result in an "NC"**. Each hour exam counts as 50 points, and the journal is 50 points (total 200 points)

Communication is important. If you feel your grade on the first exam does not reflect your understanding of the course, come see me **soon after** the exam. Often a slight change in approach or in study habits will solve the problem. You should also be aware that a shallow interaction with the subject could produce a false sense of understanding. Keep in mind that your greatest reward and feedback may come from the journal and discussions where you can divorce yourself from grade motivated learning. If this is the type of educational environment you feel most comfortable with then consider taking the course S/NC and asking for a CPR.

IV. Course Personnel:

Jonathan Waage

EEB office: 208 Walter Hall - phone 3-2435 (office hours to be announced)

U Hall office 207 Univ Hall - phone 3-2411 (office hours to be announced)

- e-mail: Jonathan_Waage@brown.edu

Graduate and Undergraduate Teaching Assistants:

To be announced in class and on the web site

Please do not bother the TAs near exam times to the extent that they cannot work in the library or get a good night's sleep. They are eager to help and will arrange review sessions. They do not know what is on the exams, and are told not to provide direct answers to questions on the study guides.

*** A Hint From The Founder Of Behavioral Ecology ***

"I have steadily endeavored to keep my mind free, so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject) as soon as facts are shown to be opposed to it." **Charles Darwin**, 1876 from his Autobiography