

ANIMAL BEHAVIOR (BIO 405W/505)
Spring 2009

INSTRUCTOR: Dr. Chris Maher
OFFICE: 201 Science
OFFICE PHONE: 780-4612
EMAIL ADDRESS: cmaher@usm.maine.edu
OFFICE HOURS: W 1:00-3:00 PM; F 9:00-10:00 AM; or by appointment

COURSE DESCRIPTION: This course introduces you to the scientific study of animal behavior, i.e., it provides you with an overview of scientific methods, approaches to the study of animal behavior, and major behavioral principles and concepts. Animals do an extraordinary amount of incredibly interesting things. However, this is not a course in natural history *per se* (The Discovery Channel) or domestic animal psychology (why does my cat refuse to use the litter box?); it is a rigorous science course that uses hypothesis testing to explain the behavior of wild animals in their natural settings.

This syllabus serves as a guide to the semester's activities; however, I reserve the right to make changes.

COURSE PREREQUISITES FOR UNDERGRADUATES: You must have completed successfully (i.e., grade of C- or higher) either BIO 107 or BIO 211. If you have not met these prerequisites, you need to speak with me individually. Recommended courses include Genetics (BIO 201), Evolution (BIO 217), and Biostatistics (MAT 220).

COURSE OBJECTIVES: Upon successfully completing this course, you should be able to:

- 1) explain major concepts of animal behavior from ultimate and proximate perspectives;
- 2) appreciate the richness and diversity of animal behavior;
- 3) discuss how science operates, i.e., the types of questions biologists ask and how they answer those questions;
- 4) synthesize and critically analyze the primary literature of animal behavior; and
- 5) communicate your ideas more effectively in written and spoken form.

WRITING INTENSIVE COURSE: Effective writing is perhaps one of the most significant skills you can develop in college. As a "W" or Writing Intensive course, you will engage in several forms of writing and learn how to communicate your ideas more effectively, particularly in a scientific format. Throughout the semester, we will discuss writing issues as they relate specifically to scientific writing. Furthermore, since effective writing takes practice, you will have the opportunity to revise many times. You should familiarize yourself with Microsoft Word and the "Track Changes" option since that is how you and I will communicate as you make revisions during the semester.

EXPECTATIONS: This is a 400-level course in biology, so I expect you to accept a greater share of the responsibility for learning than you would do in an introductory level course. I expect you to think for yourself and to critically analyze much of the information we discuss. To achieve the course objectives, you must arrive prepared for the day's events, which means you have read assignments prior to the start of class and you are prepared to discuss the material with your peers. In other words, you must take an active role in the learning process. I expect you to commit 6-9 hours each week, in addition to scheduled class meeting time, to this course.

REQUIRED TEXTS:

Alcock, J. 2005. *Animal behavior: an evolutionary approach*. 8th ed. Sinauer Associates, Inc., Sunderland, Mass.

Pechenik, J.A. 2007. *A short guide to writing about biology*. 6th ed. Pearson Longman, New York.

ATTENDANCE POLICY: I consider college students to be adults and thus responsible for making their own decisions about whether or not to attend class. However, you will complete a short writing assignment each day (see below), and we will cover and discuss a substantial amount of material in the class, so photocopying someone else's notes probably will not accurately reflect what we accomplished in class. One way to learn is to come to class, prepared both to learn and to participate in the day's activities.

COURSE WEB SITE: This course has a Blackboard website. You can access the web page at www.courses.maine.edu. Once you log in, you should see BIO 405/505 Animal Behavior on the right side of the page. Click on the link, and you will enter our course site. Here, you can communicate with me, I can communicate with you, and you can communicate with each other. I will post announcements and reminders, the syllabus, reading assignments, other important documents, relevant web sites (which you can add to), etc. Thus, this site serves as an easy way to keep track of what is happening in the course.

ACADEMIC INTEGRITY: Cheating, plagiarism, and fabrication of results all violate academic integrity. Plagiarism is a form of cheating, so you must educate yourself about this practice. Plagiarism includes portraying words or ideas as one's own, i.e., taking credit for the work of others. Even if you paraphrase, if you do not give someone credit for his/her ideas, you commit plagiarism. You must paraphrase, cite sources and include a list of those sources. Any violations of academic integrity will be handled through the Office of Community Standards, according to University policy. For more information, see www.usm.maine.edu/ocs.

DISABILITIES AND SPECIAL CONCERNS: If anyone has a known or suspected learning disability or other special concern, please meet with me as soon as possible so we can contact the Office of Support for Students with Disabilities to arrange any necessary accommodations. Even if you prefer not to receive accommodations, I urge you to disclose your disability with OSSD so we can meet students' needs more effectively.

BASES FOR GRADE: The lab is not required for students enrolled in this course; yet, some of you also are taking the lab concurrently. Therefore, I have established two "tracks" for the purposes of grade determination. If you are taking the lab, your grade will be determined somewhat differently than someone who is not taking the lab.

1) In-class writing tasks: At the beginning of each class period, I will ask you to write a brief answer to a question I pose. The question may be related to material discussed in the previous class or to reading assignments. Questions may be somewhat "factual," but they also may require you to integrate and synthesize information. Memorizing lecture notes will not suffice. The assignment should take 5-10 min, so do not be late to class! Students who arrive more than 5 min late will not be eligible to complete the day's task. I will drop your two lowest scores on these assignments. You cannot make up these tasks. If you miss class for some reason, that day's task can count toward your two dropped scores.

2) Critiques: Each student will write two short papers (about 4 pages or 1200 words) that summarize and critically analyze two recent papers (published \geq 2006) from the primary

literature. Students enrolled in BIO 505 must submit three critiques. The articles you choose should come from the list of journals provided in a separate handout. Not all of these journals are behavioral journals, but they often contain behavioral papers. Be sure your chosen articles address a behavioral concept! (Check with me if you want to be sure.) The chosen paper must be an empirical paper, not a review, i.e., it contains new data, analysis and conclusions.

In the critique, you explain the context of the study, the authors' objectives, their general approach (include only those details essential for our understanding), their results (describe patterns and trends explicitly enough that we can understand what the data "looked like"), and their conclusions. Most importantly, you provide a critical assessment of the article in which you discuss most, if not all, of the following questions: Was the problem interesting and worthwhile? Was the methodological approach appropriate? Were the results conclusive? Do you accept the authors' conclusions? Are these conclusions important? Is this an article that others working on animal behavior are likely to cite frequently or to ignore?

Regardless of the journal from which you choose the article, you must follow the format of the journal *Animal Behaviour* for your critique, and you should read chapter 7 in Pechenik for general advice about critiques (see other chapters of the book, too, for helpful hints about writing, in general). The critique must be word processed, double spaced, with 1" margins around all sides, numbered pages, and 10-12 point font. Do not include a separate title page. Include a copy of the article itself or a link to an online version of the article. NO LATE ASSIGNMENTS WILL BE ACCEPTED.

FIRST CRITIQUE DUE MONDAY, 23 FEB AT THE BEGINNING OF CLASS
SECOND CRITIQUE DUE MONDAY, 6 APR AT THE BEGINNING OF CLASS
BIO 505 STUDENTS: THIRD CRITIQUE DUE MONDAY, 27 APR AT THE BEGINNING OF CLASS

3) Journal club: Periodically during the semester, we discuss papers from the primary literature. The goal of this activity is to provide a forum in which to clarify concepts in animal behavior and to develop your critical thinking and communication skills. These papers will be available in the Biology office and in my office (for photocopying) or electronically at least one week prior to discussion. You should read the paper and make notes in a timely manner. Keep in mind that you may need to read the paper several times to truly understand it, so don't wait until the night before a journal club to prepare!

Each session, 2-3 students act as facilitators. Each facilitator selects a paper for discussion, summarizes the paper and starts the discussion by offering a question, criticism or comment on the paper's significance. They continue to direct discussion of that paper. Read chapter 14 in Pechenik for some tips. ***To be sure that everyone is prepared to discuss the day's papers, you will turn in 2-3 discussion questions for each paper.***

These discussions are meant to be constructive. Some discussions may center on trying to understand what the issues really are. (Some issues have not been clarified in the literature.) Other discussions may be critical, but they, too, should be constructive, including alternative approaches to a problem. (We will not just "trash" a paper or idea.) Discussions also might involve the ramifications of ideas, i.e., insights that an idea offers into old problems.

Don't worry about speaking out! Students often are reluctant to speak because they fear they might say something dumb or cut down someone else. Everyone eventually says something dumb if they just speak off the top of their head during a long discussion. That's OK; just move on. Don't be afraid to ask questions. Scientists make their living asking questions.

Finally, these discussions typically involve criticism. Feel free to take issue with someone's ideas, but remember that the idea, not the person, is at stake. Assume that people will take issue with your ideas, but this does not constitute a personal attack against you. Respect each other and trust each other.

4) Research project or review paper: We cannot begin to cover all topics in animal behavior, and students in this course have a wide range of interests. This assignment has two goals: a) it enables you to explore, in greater depth, some topic of animal behavior of interest to you, and b) it improves your writing and critical thinking skills. With this in mind, and to help you to understand the assignment, I will provide you with feedback at a minimum of 3 phases of the project; however, I strongly encourage you to consult with me as many times as necessary. Students enrolled in lab conduct a research project that culminates in a poster presentation at Thinking Matters; students not enrolled in lab investigate a specific topic and write a review paper. **NO LATE ASSIGNMENTS WILL BE ACCEPTED** at any phase of the project.

A word about the Web: The World Wide Web may contain interesting information; however, since anyone can post anything to the web, it is not an accepted scientific source, and you cannot use it for source materials in this course. Biologists subject their work to intense review by their peers prior to publication. The number of online journals is increasing, however, and you may use these publications since papers published electronically are peer reviewed. We have access to a large number of journals electronically, but many publishers place embargoes on journal contents, often for a year. Therefore, chances are quite high that you will have to make requests through Interlibrary Loan, particularly for papers published within the past year. They are fast, but you still need to plan ahead and remember that materials may not be available to you immediately.

a) Research project (for students enrolled in lab): This project combines literature review, experimental design, data collection, data analysis, and production of a scientific poster. By investigating, planning and conducting a research project, you can explore some facet of behavior that interests you and actively engage in the process of “doing science.” You can work on anything you want (but keep in mind the resources available to you): animals in the field, animals in the lab, domestic animals. I can help you to obtain equipment you may need to successfully carry out your project. You must submit a short abstract, a written proposal, 2 drafts, and a final poster.

You may work alone or in pairs on this project; however, if you choose to work with someone else, each of you must keep track of the time and responsibilities that each individual puts into the project, and both students receive the same final grade.

IACUC form. If you choose to handle or interact with vertebrates in any way other than simply observing them, then USM’s Institutional Animal Care and Use Committee must approve your research. The minimum time needed to complete the process is 2 weeks, and it may take longer. Therefore, you need to start very early. To access the Animal Proposal Study Form, visit the IACUC website: www.usm.maine.edu/orc/iacuc. I will work with you on the form prior to your submitting it, but **you must email it to me no later than noon on Monday, 2 February 2008**. *You may not begin to collect data until you have received IACUC approval, so we need to work quickly.*

ABSTRACT: DUE ELECTRONICALLY BY MONDAY, 2 FEBRUARY 2008 AT NOON

The deadline for submitting abstracts to Thinking Matters is Friday, 6 Feb. You must submit your abstract to me earlier so we have time to modify it before the conference deadline. Since your project obviously is not complete, the abstract should focus on the concept being studied, your objectives and hypotheses, and methods, along with a statement about what you intend to present for results.

PROPOSAL: DUE MONDAY, 9 FEBRUARY AT THE BEGINNING OF LAB

You must turn in a written proposal describing your project. Details are provided in a separate handout, and read Chapter 10 in Pechenik for additional information and suggestions. The proposal should be word processed, double spaced, with 1" margins, numbered pages, and 10-12 point font. Once you submit your proposal, you are not locked into that particular project; things change and you may change your mind. However, I must approve all major changes.

DRAFTS: Draft does not mean your first version, handwritten and thrown together at the last minute. Consider this almost your final version of particular sections of your poster, with the layout planned. It should have all the right elements in all the right places. I do not grade drafts, but I make comments and suggestions. If you elect not to turn them in, you lose 5% of your total points at the end of the semester *for each missing draft*. You may submit drafts before the due dates shown below.

Introduction and Methods: Due Monday, 2 March at the beginning of class

Poster: Due Monday, 30 March at the beginning of class

FINAL POSTER: SUBMIT BY FRIDAY, 10 APRIL FOR PRINTING

At scientific meetings, posters are popular ways to present research results. A poster is more of a visual presentation of your research compared to a written paper; the idea is to convey to the observer, clearly and succinctly, the essence of your work. Thus, text is kept to the bare minimum; type is large and easy to read; graphs also are large and clearly understandable from a distance of about 0.5 m. The entire poster should fit into a space that is about 3' high x 4' wide. Students working in pairs will produce one coauthored poster.

On Friday, 17 April, USM will hold its annual conference, "Thinking Matters", which highlights student research, scholarship and creativity. You will participate in this event, specifically the poster session held in the Sullivan Gym. You must be present from 1:00-3:00 PM; however, your poster will be on display for the entire day. For more information, visit research.usm.maine.edu/thinkingmatters.

Consult chapter 12 in Pechenik for information about preparing posters; chapter 9 also has useful information about which material should be presented in each section. We will discuss the project and the poster in more detail as the semester progresses. However, please come visit me whenever you have questions or need suggestions.

b) Review paper (for students not enrolled in lab): You will research and write a review that summarizes and synthesizes the recent primary literature concerning some topic in animal behavior of your choice. Do not focus on a particular species; instead, select a question that applies to more than one group of animals.

The review paper summarizes information provided in the papers you read, but you also evaluate those papers critically, including methodology and interpretation of the data. Do not simply repeat what the authors wrote. You must synthesize the material and draw your own conclusions about the topic. Consider including tables or figures; they may help you to present your argument.

The review must include analysis of at least 4 closely related primary references (articles containing new data and analysis) published since 2000. The paper must present a clearly organized, logically sound, and carefully written argument that addresses a specific problem or question using information from the references. The review may contain additional secondary (review) references to help establish the context and scope of your argument.

TOPIC DESCRIPTION: DUE MONDAY, 9 FEBRUARY AT THE BEGINNING OF CLASS

To be sure you have tackled a feasible subject, you must submit a brief, word processed explanation of the topic you will address in your review. Include the general question you wish to explore, a brief summary of the literature found thus far, and bibliographic information for at least two of the primary literature references you intend to analyze. Use the format from *Animal Behaviour*. I will not grade this description; however, if you elect not to turn it in, you lose 5% of your total points in the course.

DRAFT: DUE MONDAY, 30 MARCH AT THE BEGINNING OF CLASS

Draft does not mean the first version of your paper, handwritten and thrown together at the last minute. Consider this almost your final version. It should have all the right elements in all the right places. I do not grade this draft, but I provide comments and suggestions; however, if you elect not to turn it in, you lose 5% of your total points. You may submit drafts before the due date shown above, and you may turn in more than one draft; however, I must receive at least one draft on or before 30 March.

The paper should be word processed, double spaced, with 1" margins, numbered pages, and 10-12 point font. Use the format depicted in *Animal Behaviour*. See chapters 7 and 8 in Pechenik for assistance.

FINAL PAPER: DUE MONDAY, 4 MAY AT THE BEGINNING OF CLASS

5) Final exam: The final exam consists of a discussion of 1-2 journal articles that I choose. In essence, it is one last journal club. I provide you with the articles one week before the scheduled exam, which will be held Monday, 11 May, 4:15-6:15 PM. I ask each student specific questions about the papers, and we discuss them in much the same way we discussed other journal articles during the semester. You may make notes on the papers, and you may consult the papers during the exam.

GRADE DETERMINATION

For students taking BIO 405W/505 only:

In class writing tasks	20%
Journal club questions/participation	5%
Critiques	30%
Review paper	40%
Final exam	<u>5%</u>
TOTAL	100%

For students also taking BIO 406/506:

In class writing tasks	20%
Journal club questions/ participation	5%
Critiques	30%
Written proposal	5%
Research project (Poster)	35%
Final exam	<u>5%</u>
TOTAL	100%

I use the highest score earned on an assignment as an indication of the best that students could do, and I curve from there, using the scale shown below. Final grades are determined in the same manner: I curve down from the highest number of points earned in the course. EXAMPLE: Suppose the highest score on an assignment is 9 out of 10 points. The cutoff for an A- would be 90% of 9 points, or 8.1 points. Likewise, the lowest B would be 7.2 points, the lowest C would be 6.3 points, and the lowest D would be 5.4 points. If you want to know your grade at any point during the semester, see me during office hours or send me an email message.

93-100%	A	80-82.9	B-	67-69.9	D+
90-92.9	A-	77-79.9	C+	60-66.9	D
87-89.9	B+	73-76.9	C	<60	F
83-86.9	B	70-72.9	C-		