
BIO 224 Animal Behavior: An Evolutionary Approach
FALL 2009
TR 9:30-10:45, Miller 33

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Prerequisites for the course: BIO 111 or BIO 122 or PSY 100

LA Designation: Natural Science

Course Description: This course is a study of the underlying (proximate) mechanisms and evolutionary (ultimate) causes of animal behavior. Topics will include the how genes and the environmental affect the development of behavior, the neurological control of behavior, and the evolution of behavioral adaptations (habitat selection, territoriality, migration, communication, predator avoidance, foraging strategies, reproductive strategies, and social behavior). The evolution of human behavior will also be discussed. Concepts will be introduced and discussed using a hypothetico-deductive approach.

Course Goals: Students will gain an understanding of:

1. how the scientific method works and how to apply it to the study of animal behavior.
2. natural selection and evolution of behavioral adaptations.
3. the difference between proximate and ultimate explanations of behavior.
4. how genetic and environmental factors, and the interaction of the two, influence the development of behavior.

Learning Outcomes & Assessment: Upon completion of the course, students will:

- demonstrate scientific reasoning skills through the development of hypotheses to explain the evolution of behavioral adaptations. **Assessment:** exams and group/classroom discussions.
- comprehend the concepts of natural selection and evolution and how they relate to behavioral adaptations. **Assessment:** exams and group/classroom discussions.
- understand the difference between proximate (developmental and physiological) and the ultimate (ecological and evolutionary) causes of animal behavior and understand how each contribute to how and why animals behave the way that they do. **Assessment:** exams and group/classroom discussions.
- demonstrate critical analysis skills through the analysis of discussion questions. **Assessment:** group/classroom discussions.
- demonstrate the ability to engage in critical analysis in the reading and discussion of primary literature from the biological sciences. Assessment: group discussion of assigned primary literature articles related to Animal Behavior.

Required Texts:

Principles of Animal Behavior, 2nd ed., by Lee Alan Dugatkin, W.W. Norton & Co., 2009.

Class Attendance: Regular attendance is expected, and you are responsible for all material covered and all assignments made.

Readings/Assignments: It is expected that students will read the assigned material prior to attending class and complete all assignments by the due dates.

Makeup Policy for Exams: A missed exam can only be made up if you notify the instructor in advance and a valid reason is documented. Otherwise, you will receive a "0". If you must miss an exam for a legitimate, but unforeseen, reason, let me know as soon as possible; your absence will be considered unexcused until I receive notification from the Dean of Student Affairs that the absence was judged to be unavoidable due to serious illness/medical emergency or family emergency. Please note that the Dean of Student Affairs only certifies that the absence was unavoidable and due to one of the above reasons. This is to maintain student confidentiality. It is solely up to the instructors to excuse an absence. *In cases of excused absences, a make-up exam must be made within 1 week of the scheduled exam.*

Student Responsibilities:

1. Class attendance and participation are important in this course. All material will be presented as observations and we will develop hypotheses to explain the proximate and/or ultimate causes of these behaviors. We will “test” these hypotheses using the textbook and primary literature. In other words, we will apply the scientific method to the study of animal behavior. **ALL** students are expected to contribute to these discussions (see next).
2. Many lectures will include a “cooperative learning” exercise. Exercises will include either developing hypotheses to explain observed behaviors or questions from the discussion questions at the end of each chapter. After approximately 15 minutes we will reconstitute the class for discussion.

I expect that each member of a group will contribute to the discussions. If a member from your group is contributing to the discussion, please discuss this with her and try to resolve it. If the group cannot resolve the problem, then I will. I also expect that each group will contribute to the class discussions.

3. There will be three (3) essay exams. On these exams you will be asked to explain the ultimate and proximate causes of animal behavior, which can include developing and “testing” hypotheses. You might also be asked to discuss one or more of the “Discussion Questions” that I assign (but not necessarily discuss).

Exam Schedule

Exam 1: 24 September (100pts)	Exam 2: 29 October (100 pts)	Exam 3: Finals Week (150 pts.)
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Extra-credit Policy: No extra credit assignments will be given. *If you are having difficulty in the course, please see me for help.*

Final Grade: Final grades will be calculated as follows:

Grade	A. Points
A	325.5
A-	315
B+	304.5
B	290.5
B-	280
C+	269.5
C	255.5
C-	245
D+	234.5
D	220.5
F	<220.5

The above are minimum points needed for each grade. Grades are calculated as a range, e.g., a B=290.5-304.4. Grades will not be curved or rounded up.

The following are official College policies and statements.

Classroom Behavior: Disruptive behavior will not be tolerated. Any incidences will be noted and you will be penalized 1/3 of your final letter grade for each incidence (e.g., B to a B-). *Generally, disruptive behavior in the classroom is any behavior that interferes with the process of learning.* At Cedar Crest College, it is the right of every student and faculty member to engage in a classroom experience free from disruptive behavior. What is disruptive to one person might not be disruptive to another, so the final authority on disruptive behavior is the faculty member. Faculty members have the authority to address disruptive behavior in the manner they see fit under the guidelines set forth in the College Catalog (please see the section on “Classroom Protocol”).

Disruptive behavior may be viewed on a continuum ranging from the isolated incidents of mildly annoying or irritating behavior to more clearly disruptive, dangerous, and/or violent behavior.

Examples of disruptive behavior may include the following:

- Persistent speaking without permission
- Use of electronic devices, cell phones, or pagers during class
- Threats or harassment of any kind
- Poor personal hygiene
- Revealing dress
- Working on homework for other classes
- Inappropriate personal disclosures during class (sharing too much information)
- Sleeping in class
- Entering class late or leaving early (without permission)

- Eating/drinking in class without permission
- Disputing authority and arguing with faculty and other students
- Physical disruptions or physical altercations

Verbal & Written Communication: FACULTY MEMBERS ARE NOT PART OF YOUR SOCIAL CIRCLE OR PEER GROUP AND SHOULD NOT BE ADDRESSED AS SUCH. On the first day of class, faculty members will introduce themselves and express how you should address them. Addressing a faculty member by his or her first name is not acceptable unless the faculty member invites you to do so.

When addressing a faculty member in person, use a positive, respectful approach. Ideally, you should meet with faculty members during their scheduled office hours and not at the beginning or end of class unless the interaction will be brief.

When using the telephone, be sure to identify yourself at the beginning of the conversation. Be brief and concise, particularly when leaving a voice mail message. REMEMBER THAT IT IS YOUR RESPONSIBILITY TO MAKE SURE THAT YOU COMMUNICATE WITH YOUR PROFESSOR. When leaving a message, leave a time when you will call back. DO NOT EXPECT YOUR PROFESSOR TO RETURN PHONE CALLS OR TO BE THE ONE TO ENSURE CONTACT. It is always better to visit or call your professor during office hours.

When sending email, remember that your writing conveys an image of you and demonstrates respect for the recipient. Treat email as you would any other **FORMAL** written correspondence: Begin with the appropriate greeting (“Dear Dr. Smith”), use complete sentences (it is not a online chat) with good grammar and spelling, use a friendly and polite tone, and expect that faculty members will return your correspondence when they are able. Expecting an “instant response” is not realistic.

Honor Code: I fully support the Cedar Crest College Honor Code and the Classroom Protocol code as stated in the Student’s Guide Book (Section A.I). All assignments, including exams are governed by the honor code.

Plagiarism: Plagiarism is a serious offense. In academia, few, if any, offenses are considered more serious. As such, we fully support the College’s policy on plagiarism. Please see the Student’s Guide (Section A.I) for a definition of plagiarism and the College’s policy on plagiarism. Students who are found to have committed plagiarism will either be required to redo the assignment, receive an F for that assignment, or fail the course, depending on the severity of the offense. Under certain situations, those who have committed plagiarism may be suspended or expelled from the College. All cases will be reported to the Provost. **PLEASE BE AWARE THAT ACCIDENTAL PLAGIARISM CARRIES THE SAME WEIGHT AND PENALTY AS DELIBERATE PLAGIARISM.**

College Accommodations Policy: Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

Topics to be covered

We will cover the following topics. We will not cover everything in each chapter in lecture but **you should read the entire chapter**. This will help you better understand the material that we do cover. I have chosen not to write out a schedule of topics because I rather we follow a pace that is comfortable for the class and not one that is predetermined by me. All you need to do is read the textbook in the following order and stay at least one chapter ahead of where we are. OM=Outside Material

Topic	Chapter (pages)
Principles of animal Behavior <div style="text-align: right;">Tinbergen's Questions</div> <div style="text-align: right;">HILL'S HOUSE FINCHES</div> <div style="text-align: center;">Foundational Principles of Animal Behavior</div>	 1 3 (77-80) 2
The Scientific Method and its application to the Study of the Animal Behavior <div style="text-align: right;">What is <i>Science</i>?</div> <div style="text-align: right;">The Scientific Method</div> <div style="text-align: right;">Theory vs. Hypothesis</div> <div style="text-align: center;">Approaches to the study of Animal Behavior</div>	 OM OM OM 1
Evolution of Behavior: Ultimate Causation <div style="text-align: center;">Evolution, Artificial and Natural Selection</div> <div style="text-align: center;">Behavioral Genetics</div> <div style="text-align: center;">IS BEHAVIORAL VARIATION GENETIC OR ENVIRONMENTAL?</div> <div style="text-align: center;">Studying Natural Selection & Adaptations (???)</div> <div style="text-align: center;">GUPPIES & DUCKS</div> <div style="text-align: center;">PHYLOGENETIC APPROACH</div>	 2 2; OM 2; OM

The Proximate Causes of Behavior	
	Hormones 3
	Neurobiology 3
	Molecular Genetics 3
	Development 3
	Bringing all together: The Honeybee 3
Learning	
	Individual Learning 4; 1(10-13)
	Cultural Transmission 5; 1(13-16)
Behavioral Adaptations (Behavioral Ecology)	
	Sexual Selection 6
	Mating Systems 7
	Kinship 8; 2(53-56)
	Cooperation 9; 2(56-57)
	Foraging 10
	Anti-predator Behavior 11
	Communication 12
	Habitat Selection, Territoriality, & Migration 13
	Aggression 14
	Play 15
	Animal Personalities 17; OM