University of Wisconsin-Madison
Zoology 425: Behavioral Ecology
3 Credits
http://canvas.wisc.edu/courses/90172

Course Designations & Attributes
Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S

Instructional Mode
All face-to-face.
Face-to-face instruction is central to this course; students are expected to attend and participate in lecture twice per week. In addition, all students are expected to read papers from the scientific literature and post comments on these papers online. Optional discussion sections are available each week to provide a forum for students to discuss the readings from the literature with other students and the course TA.

Credit Hours:
This class meets for two 50-minute class period each week over the spring semester and carries the expectation that students will work on course learning activities (reading, studying, etc) for about 2 hours out of classroom for every class period. This syllabus includes additional information about meeting times and expectations for student work.

Lectures:	Tuesday and Thursday 11:00am-12:15pm, Noland 132
Discussion Section (Optional):	Tuesday 4:00-4:50 pm, Noland 119
	Wednesday 2:25-3:15 pm, Birge 346
	Thursday 2:25-3:15 pm, Birge 346

Instructor:	Dr. John Orrock, Associate Professor
Office:	Birge 356
e-mail:	jorrock@wisc.edu
Office hours:	Monday 8:30-9:30, Birge 356
	Friday 8:30-9:30, Birge 356

Teaching Assistant:	Savannah Bartel
Office:	Birge 363
email:	bartel2@wisc.edu
Office hours:	Wednesday 3:30-4:30, Birge 447
	Thursday 1:15-2:15, Birge 447

Course text: Introduction to Behavioural Ecology by Krebs, Davies, and West. Fourth Edition. Blackwell Publishing, 2012. ***Note that this text is optional.*** There is also a third edition which would be sufficient as supporting material for the course (and may be less expensive); ultimately, however, note that there is no required text for this course.

Course Description: Designed to explore how organisms make decisions and how these decisions affect their survival. These decisions are key aspects of an organism's life, e.g. foraging behavior, mating behavior, anti-predator behavior, and habitat selection. The course approaches

these questions with the perspective that understanding the proximal and ultimate basis of behavior requires understanding the ecological and evolutionary context of behavior.

Requisites: Intro biology (Zoology/Botany 151 & 152 or Zoology 101 & Botany 130 or Biocore 301 & 302).
Recommended: Evolution, ecology, genetics.

Course Learning Outcomes:
Students will be able to:
- use facts to guide conceptual thinking and hypothesis tests about organismal behavior,
- draw upon aspects of evolution and ecology to develop an integrative perspective on organism behavior,
- read and interpret graphical models of animal behavior and graphs of empirical data,
- summarize research in the key focal areas of behavioral ecology, including optimal diet models, optimal patch use, anti-predator behavior, communication, and mate selection,
- read papers from the primary scientific literature and synthesize their findings,
- understand how behavioral ecology informs contemporary ecological issues such as conservation and invasive species.

Student responsibilities: It is the student's responsibility to attend class, check the course webpage, and stay abreast of changes in scheduling. Students are responsible for all material presented in class lectures and all portions of the lecture text relevant to material discussed in lectures. In addition to lectures and the text, students will also be assigned readings from the primary scientific literature and students are expected to post online comments regarding the assigned readings.

Grading overview: The course grade is determined by performance on examinations administered during class as well as by participation in online discussion/comments of assigned readings. Final grades are based on 320 total possible points. This 320 points is composed of each of the 2 highest exam grades from the first three exams (100 possible points each), the grade on the fourth exam (100 possible points) and 2 points for posting at least one online comment for each of 10 assigned papers by 5pm Friday during the week it is assigned (20 possible total points). For example, if a student receives grades of 60, 45, 90, on their first three exams, 71 on the final exam, and they post comments on 5 of the 10 assigned readings, their final grade is: (60+90) +71 + 10 = 231 / 320 = 0.722 (i.e. 72.0%). This would result in a final grade of C for the course, as the grading scale is: A: 90 - 100%, AB: 87 - 89%, B: 80 - 86%, BC: 77 - 79%, C: 70 - 76%, D: 60 - 69%, F: 0 - 59%. For students taking the class on a pass/fail basis, a C is considered a passing grade. Although it is unlikely that grades will be curved, the final decision regarding implementation of a curve will be made at the end of the semester as the comprehensive grade distribution for the class is evaluated.

Exams: There will be four exams in this course. Each exam is cumulative; i.e. exams may contain topics covered at any prior point in the semester. Topics on the exam may be taken from assigned readings from the scientific literature or from material presented in class. At the end of the semester, your lowest exam grade from the first three exams will be dropped. The remaining two exams and your final exam will contribute equally to your grade (see details on grading, below). **No makeup exams will be given**. If you are forced to miss one of the first three exams, that exam will become your dropped exam grade. On exam days, please arrive a few minutes early to class

so you will have the maximum time available to work on the exam. Please do not wear hats on exam days.

Dr. Orrock and the course TA do everything possible to insure that your exams are graded in an accurate and objective manner. However, if you believe that a portion of your test has been incorrectly graded, you should **first visit the TA and consult the answer key.** Once you are certain that an error was made, you may request that your test be re-graded. To request that your exam be re-graded, students must follow this procedure: obtain a re-grade request form from the instructor, staple it to the exam, and submit the request and exam by 4:30 pm within a week of the day the exam is returned (e.g., if the exam was returned on Thursday, you must submit your re-grade request by 4:30 pm the next Thursday). This formal re-grade policy is to insure that all re-grade requests are treated fairly and objectively. Please note that your entire exam may be re-graded as part of the re-grading process. As a result, if additional errors are found on your exam during the re-grading process, these will be applied to your final grade on the exam. Please note that, due to the close temporal proximity of the final exam and submission of final grades, regrade requests cannot be accepted for the fourth exam. Simple errors of addition (e.g. you missed 10 points on the test but the score was incorrectly posted as an 88) can be remedied without the submission of a formal re-grade request; just bring the error to Dr. Orrock's attention within a week of when the exam was returned.

Assigned readings, posting comments online, and discussion sections: Students are expected to read scientific papers from the primary literature (see list at end of syllabus, along with the week when that paper is to be read); questions relating to these papers may appear on exams, even if not explicitly discussed in class.

Several discussion sections are held each week to provide a time when students can discuss these papers with the course TA. Although attendance is not mandatory, students are encouraged to go to the discussion section (described below) to discuss papers and the importance of their findings.

In addition to reading the papers, students are expected to post at least one comment for each paper on Canvas. Comments are to be posted by 5pm Friday for the week when the paper is assigned. The sole exception is Emlen and Oring, which is assigned over a 3-week period; the comment for Emlen and Oring is due by the third Friday, April 1). Comments must be full sentences that make reasonable statements regarding the assigned paper (comments that build constructively off of the comments of previous students are also acceptable). Questions that are likely good for thinking about comments: What is the importance of this paper (i.e. what is its primary contribution(s) to the field of behavioral ecology)? Did you find the methods of the paper appropriate? Was the experimental design confounded in any way, even if unintentionally? How might the conclusions from this paper apply to a different animal species or a different study system? Please note that comments that do not illustrate a clear understanding of the paper will not be considered for credit (e.g. "I thought the paper was great." or "I agree with my classmates." are not sufficient comments).

Important Note: The schedule, topics covered, and timing of exams are all tentative and may change over the course of the semester.

Academic honesty and integrity: All students are expected to strictly adhere to the University of Wisconsin's policy regarding academic integrity. Evidence of cheating or attempted cheating will be dealt with by the staff following published UW-Madison policies. A confirmed cheater will receive a failing grade for the course. The situation may be referred to the office of the Student Assistance and Judicial Affairs, and a Dean for further action. Please refer to the undergraduate student

Academic Misconduct information on the UW-Madison website at: https://students.wisc.edu/doso/docs/UWS14.pdf.

Disability Services: Students who are seeking disability information or support for a disability should contact the McBurney Center http://www.mcburney.wisc.edu/information/mission.php or 263-2741. The McBurney Center is responsible for approving and helping to arrange all accommodations for UW-Madison students. If you require special accommodations for exams or other lecture activities, please see Dr. Orrock immediately so that these accommodations can be made well in advance of exam dates or other course deadlines. Bring your McBurney documentation to support your request.

Attendance policy: Learning is a proactive experience. As such, students are encouraged to attend every lecture. The instructor and TA are not responsible for providing students with materials for classes they did not attend. *While in class, turn off your cell phones and do not use any electronic devices unless you are using them to take notes.* If student laptop use becomes distracting to other students (e.g., because of internet surfing, checking e-mail, etc.), the instructor reserves the right to ask students to shut-down their laptops or to leave the classroom.

Getting assistance: The TA and Dr. Orrock will hold regular office hours every week; students are welcome to drop by to discuss course material. Be sure to seek assistance in time to receive it – for example, if you e-mail Monday night about a test on Tuesday, I may not have time to respond to your e-mail.

Communication: In addition to meeting with Dr. Orrock or the TA in person (e.g., after class, during a discussion section or office hours), you may communicate with us by email. Although we will strive to answer emails in a timely manner (i.e., within 48 hours), keep in mind that we may not check email outside of normal business hours.

In addition to posts on the course website, Dr. Orrock and the TA may communicate with you by email. A course email list-serve is set up for instructor and TA to contact the scores of students enrolled in this course. **Students are not to post messages using the course list-serve**. Any student who sends messages to the entire course risks administrative action.

Tentative course schedule

Date	Topic	Chapter in Krebs, Davies & West
Jan 23	Introduction: the foundations of behavioral ecology	1
25	Natural selection and adaptation	1
30	Natural selection; Behavior and hypothesis testing	2
Feb 1	Hypothesis testing and approaches to behavioral ecology	2
Feb 6	Foraging and optimality	3
8	Foraging, energy, and predation risk	3

13	Predation, anti-predator behavior, crypsis, warning coloration	4
15	**Exam 1**	
20	Predator-prey arms races; parasites and behavior	4
22	Competition – habitat selection and IFD, territoriality	5
27	Territory size, balancing competition and predation	5
March 1	Group living: costs and benefits	6
6	Aggression, fighting, bluffing	6
8	Sexual selection	7
13	**Exam 2**	
15	Mate selection: the male's perspective	7
20	Mate selection: the female's perspective	8
22	Parental care, Mating systems	8-9
24-April 1	**Spring Break (No Classes)**	
3	Mating systems	9
5	Mating systems, alternative strategies	9-10
April 10	Kin selection and altruism	11
12	**Exam 3**	
17	Cooperation and game theory	11-12
19	Cooperation continued	12
24	Signals and communication	14
26	Communication, Behavior and landscape ecology	14
May 1	Behavior and conservation, biological invasions	
3	**Exam 4**	

Discussion Readings (by week):

Week of:

Jan 23: No paper

Jan 30: Lima 1984. Downy woodpecker foraging behavior: efficient sampling in simple stochastic environments. Ecology 65:166-174.

Feb 6: Rattenborg, Lima, and Amlaner. 1999. Half-awake to the risk of predation. Nature 397: 397-398

Feb 13: Exam coming up (exam review during discussion time)

Feb 20: Morris 2006. Moving to the ideal free home. Nature 443: 645-646

Feb 27: Pravosudov 2008. Mountain chickadees discriminate between potential cache pilferers and non-pilferers. Proceedings of the Royal Society B 275:55-61.

March 6: Exam coming up (exam review during discussion time)

March 13: Emlen and Oring 1977. Ecology, sexual selection, and the evolution of mating systems. Science 197: 215-223.

March 20: Emlen and Oring 1977, continued

March 27: Spring break

April 3: Nowak 2006. Five rules for the evolution of cooperation. Science 314:1560-1563

April 10: Karban 2008. Plant behavior and communication. Ecology Letters 11:727-739

April 17: Templeton, Greene, and Davis. 2005. Allometry of alarm calls: Black-capped Chickadees encode information about predator size. Science 308:1934-1937.

April 24: Caro 2007. Behavior and conservation: a bridge too far? Trends in Ecology and Evolution 22: 394-400

May 1: Schlaepfer, Sherman, Blossey, and Runge. 2005. Introduced species as evolutionary traps. Ecology Letters 8:241-246.