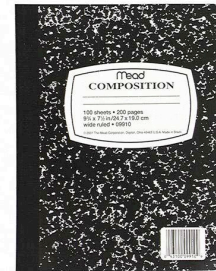


Behavioral & Evolutionary Ecology

Biology 587, 3 credits, Fall 2013

Biology Department, New Mexico State University

- Instructor** Dr. Kathryn Hanley
Office: Foster 479
Phone: 646-4583
E-mail: khanley@nmsu.edu
- Meetings** M, W, F 10:30-11:20* Foster 146
*or as designated; note additional weekend meeting times & locations
- Office Hours** Mondays 12:00-1:00
Tuesdays 1:00-2:00
Or by appointment
- Readings** There is no assigned book; despite extensive searching neither I nor the other professors who teach BIOL 587 have yet discovered a textbook for this class with which we are satisfied. Readings will include handouts of chapters from various books and articles from the primary literature posted on Canvas. I expect you to complete the reading assigned to each class prior to that class as it will be the basis of in-class discussions.
- Other supplies** A cloth-bound composition notebook is required. This notebook will be graded, and I will only accept a bound book (e.g. photo to the right). You will also need pencils, a backpack, and a watch or other timer. Binoculars are optional but very useful; I can provide some pairs to those who don't have them. A sunhat and hiking boots are highly recommended. I will also ask you to purchase some small field supplies (e.g. supplies for making tracking cards; aluminum flashing for enclosures), to be determined over the course of the class.



Webpage

The course web page is available in Canvas. General course information, required and supplementary readings, lecture notes, and exam keys will be posted on this site. Note that lecture notes posted on Canvas will contain substantial omissions of actual material presented in class, thus downloading the notes is not a substitute for attending lecture.

Messages

Official course communication to you will often come through your Canvas e-mail. Please access it regularly. To email me, please use khanley@nmsu.edu

Overview This class will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits. The class includes both lectures/class discussions as well as field- and computer-based studies conducted primarily on Fridays and on designated weekend meeting times. The lectures are divided into three main sections, which focus on: (i) fundamental processes in evolutionary ecology, (ii) behavioral ecology and the evolutionary ecology of life history traits, and (iii) special topics of interest. The field/computer studies offer “minds-on” experience in experimental design and data analysis and hands-on experience with a subset of the techniques used to test questions in behavioral and evolutionary ecology, such as the comparative method, ecological surveys, and behavioral observations. Results from each study will be presented orally and/or in written form, as designated.

Prerequisites This is a class for graduate students that assumes a familiarity with basic evolution, ecology and genetics. While there are no explicit prerequisites, previous classes in behavior, genetics, evolution and ecology will be helpful. If you are unsure whether you have sufficient background for the class, consult with the instructor.

Evaluation Final grades will be based on class participation and specified exercises (noted here and described in detail elsewhere) as follows:

<u>Category</u>	<u>% of grade</u>
Class participation	15
Exam I	15
Exam II	15
Field Study I or II Write-Up	15
Field Notebook	10
Study III (Comp. Method) Oral Pres.	15
Study III (Comp. Method) Write-Up	15

Honor **Intellectual honesty and academic honor are fundamental expectations of all students in this course and are taken very seriously by the instructor; see the NMSU student code of conduct at <http://deanofstudents.nmsu.edu/student-handbook/1-student-code-of-conduct/index.html>.** I expect each student to submit his/her own original work in every exercise. Cheating, plagiarism (both intentional and unintentional), and other academic misconduct will not be tolerated. Intentional or unintentional plagiarism automatically will result in failure on that assignment and, depending on the extent of the plagiarism and at the discretion of the instructor, may result in failure of the class. If a student is unsure whether he or she is being academically dishonest, then he or she should ask one of me for clarification (in person or via email) prior to completing the exercise. Plagiarism is using another person's

work without acknowledgment, making it appear to be one's own. PRIOR TO THE SECOND MEETING OF THE CLASS, every student is required to read in its entirety the definition of plagiarism presented at the NMSU Library website: <http://lib.nmsu.edu/plagiarism/>.

Withdrawals It is the responsibility of the student to complete the necessary paperwork to withdraw from the class should he or she decide to do so.

Attendance Lecture attendance is expected except for documented university business or extreme emergencies, and regular participation will greatly improve your success in the course. You will be graded on your participation in class (see above). Extreme emergencies must be documented.

Syllabus I reserve the right to modify the syllabus to accommodate individual or university exigencies, to better facilitate class learning, or to delve more deeply into topics of interest to the class.

Disabilities & Accommodations

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) covers issues relating to disability and accommodations. If a student has questions or needs an accommodation in the classroom (all medical information is treated confidentially), contact: Trudy Luken, Director
Student Accessibility Services (SAS)
Corbett Center, Rm. 244
Phone: (575) 646-6840
E-mail: sas@nmsu.edu
Website: www.nmsu.edu/~ssd/

NMSU policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans status.

Furthermore, Title IX prohibits sex discrimination to include sexual misconduct, sexual violence, sexual harassment and retaliation. For more information on discrimination issues, Title IX or NMSU's complaint process contact: Gerard Nevarez, Executive Director or Agustin Diaz, Associate Director, Office of Institutional Equity (OIE)
O'Loughlin House
Phone: (575) 646-3635
E-mail: equity@nmsu.edu
Website: <http://www.nmsu.edu/~eeo/>

Class Schedule and Readings

Readings are available on Canvas or will be given as handouts (noted with an ^H).
Please bring printouts of assigned readings to each class to facilitate discussion

Date	Day	Topic	Readings
8/23	F	Introduction & Organization	
8/26	M	L1: What is Behavioral & Evolutionary Ecology?	Sherratt et al. 2005
8/28	W	L2. Causes & Consequences of Variation	Fox, Roff & Fairbairn Chs 1, 2 ^H
8/30	F	L3. Principles of Experimental Design	Krebs Ch 8 ^H NIH Guide to Keeping a Notebook
9/2	M	<i>Labor Day—Enjoy!</i>	
9/4	W	L4. Natural Selection	Cook 2003 Cook & Saccheri 2013
9/6	F	Study 1: Better the Devil You Know? <i>Study Design</i>	
9/9	M	L5: Adaptation	Patin and Quintana-Murci 2008 Kolbe et al. 2012
9/11	W	L6. Adaptation to Climate Change	Franks and Hoffman 2012
9/13	F	Study 1: Better the Devil You Know? <i>Preparation</i>	
9/14	Sat	<i>Study 1: Conduct Study</i> <i>OR</i>	
9/15	Sun	<i>Study 1: Conduct Study</i> <i>Morning meetings (specific times based on weather forecast)</i>	
9/16	M	L7. Phenotypic Plasticity	Pfennig et al. 2010
9/18	W	L8. Sexual Selection	Andersson and Simmons 2006 Shingleton and Frankino 2012
9/20	F	<i>No class meeting:</i> <i>Data Collection for Study I</i>	

9/23	M	L9. Maladaptation	Nesse 2005
9/25	W	L10. Trade-Offs	Bonter et al. 2013
9/27	F	Study I: Better the Devil You Know? <i>Data analysis and discussion</i>	
9/30	M	L11: Measuring Behavior	Martin and Bateson Chs 3, 4, 5 & 7 ^H Bart et al. 1998 ^H
10/2	W	Study 2: Constant Vigilance! <i>Study Design</i>	Elgar 1989
10/4	F	Study 2: Constant Vigilance! <i>Preliminary Observations</i>	
10/5/6-7		<i>Study 2: Constant Vigilance! Observations at Bosque del Apache</i>	
10/7	M	L12: Conflicts	Haig 1996 John 2013
10/9	W	<i>Exam I</i>	
10/11	F	<i>No class meeting – Study 2: Observations at El Paso Zoo</i>	
10/14	M	L13: Behavioral Genetics & Syndromes <i>Last Day to Drop the Class with a “W”</i>	Careau & Garland 2013
10/16	W	L14: Cognition	O’Donnell et al. 2012
10/18	F	Study 2: Constant Vigilance! <i>Data Analysis</i>	
10/21	M	L15: Game Theory & Evolutionary Stable Strategies	Easley and Kleinberg 2010 Sinervo and Lively 1996
10/23	W	Study 3: Comparative Method <i>Introduction</i>	TBA
10/25	F	Study 3: Comparative Method <i>Methods</i>	TBA
10/28	M	L16: Evolution of Sex	Meirmans et al. 2012

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10/30	W	L17: Mating Systems	Mobley and Jones 2009
11/1	F	<i>No class meeting: Study 3. Comparative Method-Library Research</i>	
11/4	M	L18: Investment in Offspring	Trivers and Willard 1973
11/6	W	L19: Dispersal	Clobert et al. 2009
11/8	F	Study 3: Comparative Method <i>Group meetings with Dr. Hanley</i>	
11/11	M	L20: Kin Selection and Sociality	Pusey 2005 ^H Tibbetts & Reeve 2008
11/13	W	L21: Cooperation, Altruism and Spite	TBA
11/15	F	L22. Cultural Evolution	TBA
11/18	M	Study 3: Comparative Method: <i>Analyses</i>	
11/20	W	Study 3: Comparative Method: <i>Analyses</i>	
11/22	F	<i>Exam II</i>	
11/25-29		<i>Thanksgiving Break—Relax!</i>	
12/2	M	L23: Sociality in Microbes-Public and Private Goods	Diggle et al. 2007
12/4	W	L24: Parasite Manipulation of Host Behavior – the Extended Phenotype	Lefevre et al. 2009
12/6	F	L25: Evolutionary Ecology of the Microbiome	Ezenwa et al. 2012
12/9	M	<u>8:00 – 10:00 am</u> Final Class Meeting <i>Oral Presentations of Comparative Method Studies Write-up of Comparative Method Study Due</i>	

READINGS

- ANDERSSON, M. & SIMMONS, L. W. (2006). Sexual selection and mate choice. *Trends Ecol Evol*, 21(6), 296-302.
- BART, J., FLIGNER, M. A. & NOTZ, W. I. (1998). *Sampling and Statistical Methods for Behavioral Ecologists*. New York, NY: Cambridge University Press.
- BONTER, D. N., ZUCKERBERG, B., SEDGWICK, C. W. & HOCHACHKA, W. M. (2013). Daily foraging patterns in free-living birds: exploring the predation-starvation trade-off. *Proc Biol Sci*, 280(1760), 20123087.
- CAREAU, V. & GARLAND, T., JR. (2012). Performance, personality, and energetics: correlation, causation, and mechanism. *Physiol Biochem Zool*, 85(6), 543-571.
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- COOK, L. M. (2003). The rise and fall of the Carbonaria form of the peppered moth. *Q Rev Biol*, 78(4), 399-417.
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- ELGAR, M. A. (1989). Predator vigilance and group size in mammals and birds: a critical review of the empirical evidence. *Biol Rev Camb Philos Soc*, 64(1), 13-33.
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- JOHN, R. M. (2013). Epigenetic regulation of placental endocrine lineages and complications of pregnancy. *Biochem Soc Trans*, 41(3), 701-709.
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- KREBS, C. J. (1999). *Ecological Methodology*, Second edition. New York: Addison Wesley Longman, Inc.
- LEFEVRE, T., ADAMO, S. A., BIRON, D. G., MISSE, D., HUGHES, D. & THOMAS, F. (2009). Invasion of the body snatchers: the diversity and evolution of manipulative strategies in host-parasite interactions. *Adv Parasitol*, 68, 45-83.
- MARTIN, P. & BATESON, P. (2007). *Measuring Behavior*, third edition. New York, NY: Cambridge University Press.
- MEIRMANS, S., MEIRMANS, P. G. & KIRKENDALL, L. R. (2012). The costs of sex: facing real-world complexities. *Q Rev Biol*, 87(1), 19-40.

- MOBLEY, K. B. & JONES, A. G. (2009). Environmental, demographic, and genetic mating system variation among five geographically distinct dusky pipefish (*Syngnathus floridae*) populations. *Mol Ecol*, 18(7), 1476-1490.
- PFENNIG, D. W., WUND, M. A., SNELL-ROOD, E. C., CRUICKSHANK, T., SCHLICHTING, C. D. & MOCZEK, A. P. (2010). Phenotypic plasticity's impacts on diversification and speciation. *Trends Ecol Evol*, 25(8), 459-467.
- O'DONNELL, S., LOGAN, C. J. & CLAYTON, N. S. (2012). Specializations of birds that attend army ant raids: an ecological approach to cognitive and behavioral studies. *Behav Processes*, 91(3), 267-274.
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