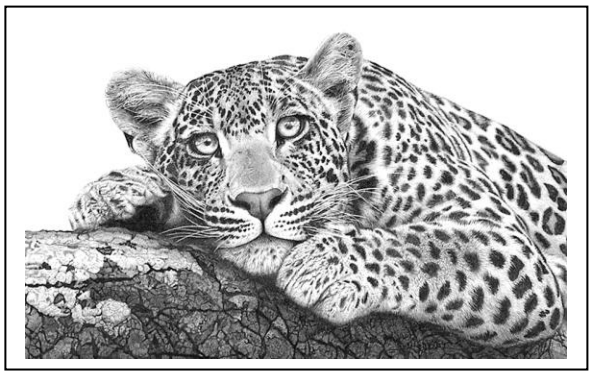
Biology 430 Syllabus
Animal Behavior
Fall 2017



But ask the animals, and they will teach you, or the birds of the air, and they will tell you; or let the fish of the sea inform you. Which of all these does not know that the hand of the Lord has done this? (Job 12: 7-10, NIV)

Catalog Course Description: BIO 430 - Animal Behavior (3 units)
An exploration of the behavioral biology of animals, including behavior genetics, physiological mechanisms, development, learning, neuro-physiology, ecology, reproduction, and social behavior; insights from ethology, psychology, behavioral ecology, and sociobiology are also studied. Labs emphasize various aspects of behavioral research in field settings and students conduct their own research projects. Lecture and lab. Prerequisite: BIO 211.

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Texts: Animal Behavior, 9th edition by John Alcock; Sinauer, 2013; ISBN 9780878932252.

Measuring Behavior, 3nd edition, by Paul Martin & Patrick Bateson; Cambridge University Press, 2007; ISBN 9780521535632

Lecture:	MWF	1:30-2:25	Evans Hall 121
Lab:	Wed	2:45-6:15 PM	Latter Hall 2

Student Learning Outcomes:
Upon completion of the course, each student will be able to:

- state Tinbergen's four problems and identify questions as being either proximate or ultimate
- explain how behavior develops on the proximate level and give hypotheses for behavioral differences
- design, execute, and interpret an original research project based on behavioral observations
- argue for the possession of emotions, self-awareness, and consciousness in non-human animals
- articulate the importance of behavior to the practice of conservation biology

COURSE DESIGN

(1) Textbook Readings and Guided Questions: I have prepared a set of guided questions for each topic reading in the Alcock textbook that is available on Canvas under 'Assignments'. There are 1-2 for each week of the course and are due the following Monday. The guided questions are designed to: (1) help you focus on the information that is most relevant to this course, (2) prepare you for iClicker quizzes and midterm exams, and (3) give you the foundational knowledge needed for in-class activities. Since all the guided questions are posted, you can do them ahead of time if you wish. If you submit the assignment on time you will get some points. I highly recommend that you do them because it will give you a "leg up" in the course!

(2) Canvas: All the class material will be available to you on the course Canvas site, and assignments will be submitted via Canvas 'Assignments' and graded online. The only exception will be activities done entirely in class. I promise to recycle all paper used! All assignments have a due date and late assignments will be docked points (see below), so try to stay current on all assignments. Please note that CANVAS DOES NOT SUPPORT PAGES – you may submit Word or PDF documents.

(3) Late Assignments: Late penalties will apply for all assignments submitted after the due date. For labs and journal article assignments (20 pts), 2 points will be deducted for each day late (no points after 10 days). A proportionately similar penalty will be applied for assignments of different point values. The intent of late penalties is to encourage you to turn in your work on time, and to be fair to those who do turn in their work on time. However, if you have a legitimate reason for not submitting an assignment on time, please tell me (by emailing directly) and the grader (by including a note in the text box when you submit).

(**4**) **Academic Honesty**: The PLNU policy on academic honesty is listed under the institutional policies below. My experience is that many students are not aware that some of their regular practices are considered plagiarism. For example, while you are free to discuss readings and lecture material among yourselves, I expect that you will each do your own work on individual assignments. In this case, teaming up with other students to write joint answers is plagiarism. Do not share electronic files of your answers to an assignment with another student; if they subsequently use your answers you are also guilty of plagiarism. Finally, copying and pasting answers to assignments from online or digital resources is very much plagiarism – use your own words and ideas!

(5) iClickers: Class will involve a combination of lecture, in-class assignments, and small group activities. Classroom quizzes based on readings and assignments will be administered in class using iClicker2, therefore you must ALWAYS bring your clicker to class. iClicker questions will represent about 10% of your total grade in the course. Everyone must have their own remote and it must be registered so that your participation is recorded. Clickers will be used to assess both participation (engagement) and performance (getting the right answer). You can earn up to 50 total iClicker points, which is completely do-able if you do the readings and assignments.

(6) Course Attendance Policy: In registering for this class, you have made a covenant to attend class and complete all assignments to the best of your ability. You are required to sign the attendance roster at each class meeting, which is how I determine excess absences. You are permitted 5 absences without penalty. Every absence in excess of 5 will incur a penalty to be deducted from your attendance participation points. Please be conscientious about showing up!

(7) Journal Articles: A crucial ingredient in the process of becoming a scientist is the reading and interpretation of journal articles. We will read several classic animal behavior articles relevant to our current topic. Each topic will involve a different task, such as writing an abstract, identifying the hypotheses being tested, and so forth.

(8) Labs: The first 3 labs will involve training sessions on the methodology of conducting behavioral research, which will prepare you for your field research assignment. Later labs will be used introduce you to professionals at the San Diego Zoo and Sea World who will talk about how they use behavioral principles to solve conservation problems (conservation behavior). Most guest lectures will be on campus, but we may travel to the Institute for Conservation Research at the Safari Park for some. *It is extremely important to arrive punctually when we go on a field trip because we will be on a tight time budget.* The final lab period is reserved for presentation of your group research projects.

(9) Exams: Most exams will be a combination of multiple choice questions administered in iClicker self-paced mode with some short answer/essay extra credit questions. The final exam will be semi-cumulative, meaning that key concepts will be included from the semester. A study guide will be available on Canvas for each exam.

(10) Field Research Project: Each of you will work in teams to design and conduct a research project involving behavioral observations at the San Diego Zoo. I am working with the zoo staff to prioritize the species and behavioral observations that will be most beneficial to the zoo and you will be assigned a project. I have also arranged for you to get entrance to the zoo at any time during normal public viewing hours (be sure that you bring your student ID). You are encouraged to conduct your data collection at least once a week for 10 weeks, for at least 12 hours of observation time per student over the semester. Following completion of the field work, you will analyze your data and write up your results in scientific journal format. The paper should be a minimum of 5 pages and is to be submitted no later than the last day of class. During the final lab period your team will give a PowerPoint presentation to the class on the results of your research project.

(11) Technology Etiquette: Recent studies have indicated that we are currently experiencing an epidemic of 'digital distraction' caused by multi-tasking – moving quickly between tasks on electronic devices in which only partial attention is given to each task. In the classroom setting, studies reveal that the use of laptops for non-course related tasks (e.g., checking emails, Facebook) distracts attention from learning and results in reduced academic performance and lowered grades. The reality is that you cannot fully learn new information or master new concepts when distracted by multi-tasking. The evidence indicates that even classmates that see your screen are distracted and their performance reduced. To ensure the best learning environment possible, classroom policy is that ALL ELECTRONIC DEVICES ARE TURNED OFF AND PUT OUT OF SIGHT when class is in session. This INCLUDES LAPTOPS because there is evidence that students learn better when they have to take notes by hand. The studies are posted on Canvas, along with strategies for managing your use of electronics.

Why am I asking you not to use laptops?

1. It is hard to not check other things, which impairs your learning. You most likely are not aware of the impairment, but the research is quite clear.
http://www.slate.com/articles/health_and_science/science/2013/05/multitasking_while_studying_divided_attention_and_technological_gadgets.html

2. Even if it doesn't impair your learning, it impairs others learning.
http://www.sciencedirect.com/science/article/pii/S0360131512002254

3. You write more but learn less. Writing your notes creates synthesis which increases your learning.
http://pss.sagepub.com/content/early/2014/04/22/0956797614524581.abstract
http://chronicle.com/blogs/linguafranca/2014/08/25/why-im-asking-you-not-to-use-laptops/?cid=at&utm_source=at&utm_medium=en

For these reasons I am asking you not to use laptops. If you really feel you 'need' or strongly prefer a laptop to take notes, you can talk to me and we will make that work.

Grading Criteria

Points are estimates and may change

• Guided questions 20 @ 5 pts	100
• Attendance points	50
• iClicker Participation points	50
• Midterm exams - 2 @ 100 pts	200
• Cumulative final exam	100
• Lab/Guest Lectures - 10 @ 20 pts	200
• Journal article assignments - 6 @ 20 pts	120
• Team research paper	100
TOTAL POINTS	**920**

LETTER GRADES:

A	90%	C	70%
A-	88%	C-	68%
B+	86%	D+	66%
B	80%	D	60%
B-	78%	D-	58%
C+	76%	F	< 58%

PLNU INSTITUTIONAL POLICIES

PLNU Mission: To Teach ~ To Shape ~ To Send
Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

PLNU Attendance and Participation Policy: Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Undergraduate Academic Catalog.

PLNU Academic Honesty Policy: Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

PLNU Academic Accommodations Policy: If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information.

PLNU Copyright Policy: Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU Final Examination Policy:
Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on this syllabus. No requests for early examinations or alternative days will be approved unless you have 3 final exams scheduled on the same day or another compelling reason.

ANIMAL BEHAVIOR CLASS SCHEDULE - FALL 2017

DATE	TOPIC	CHAPTER	TRIALS OF LIFE
Aug 29-Sept 1	An introduction to animal behavior	1	
Sept 4	**LABOR DAY**		
Sept 6-8	Proximate and ultimate causes of behavior	2	*Signals and songs*
SEPT 8 - JOURNAL ARTICLE #1			
Sept 11-15	The development of behavior: focus on heredity	3	
Sept 18-22	The development of behavior: focus on environment	3	*Growing up*
SEPT 22 - JOURNAL ARTICLE #2			
Sept 25	*Dr. Mooring at Au Sable in Michigan*		
Sept 25-29	Control of behavior: neural mechanisms	4	
OCT 29 - JOURNAL ARTICLE #3			
Oct 2-6	Organization of behavior: neurons and hormones **Exam 1-WED OCT 4**	5	
Oct 9-13	Behavioral adaptations	6	*Hunting and escaping*
OCT 13 - JOURNAL ARTICLE #4			
Oct 16-18	Parasite defense and animal medicine	Hart 2011	*Living together*
Oct 20	**FALL BREAK**		
Oct 23-27	Evolution of feeding behavior	7	*Finding food*
OCT 27 - JOURNAL ARTICLE #5			
Oct 30-Nov 3	Choosing where to live	8	*Homemaking*
Nov 6-10	Evolution of communication **Exam 2 – WED NOV 8**	9	*Talking to strangers*
Nov 13-17	Evolution of reproductive behavior	10	*Continuing the line*
NOV 17 - JOURNAL ARTICLE #6			
Nov 20	Evolution of mating systems	11	*Fighting; Courting*
Nov 22-24	**THANKSGIVING RECESS**		
Nov 27-Dec 1	Evolution of parental care and social behavior	12-13	*Friends and rivals*
Dec 4-8	Evolution and domestication of dogs	Grimm 2015; MacLean & Hare 2015	
Dec 11	**FINAL EXAM MONDAY 1:30-4:00 pm**		

BIO 430 LAB SCHEDULE 2017 – *WEDNESDAY 2:45-6:15 PM* –
All labs meet in ***LATTER HALL 2*** *unless otherwise noted*

Wed	Presenter / Topic	Location	Reading
Aug 30	Behavioral Observation Methods I	Latter Hall 2	M&B: Ch. 1-4
Sept 6	Behavioral Observation Methods II	Latter Hall 2	M&B: Ch. 5-8
Sept 13	Preliminary Observations	San Diego Zoo – work with your team	
Sept 20	Bob Wiese, San Diego Zoo Global Conservation and behavior at SDZG	Latter Hall 2	Greggor et al. 2016
Sept 27	Animal Emotions	Latter Hall 2	
Oct 4 **EXAM 1**	Animal Consciousness	Latter Hall 2	
Oct 11	Debra Shier, SDZG-ICR Species Reintroduction	Latter Hall 2	Shier 2006
Oct 18	Animals Like Us – Medicine	Latter Hall 2	
Oct 25	Peter Gilson, San Diego Zoo Conservation Education	Latter Hall 2	TBD
Nov 1	Ron Swaisgood, SDZG-ICR Desert tortoise behavioral ecology	Latter Hall 2	Germano et al. 2017
Nov 8 **EXAM 2**	Animal Odd Couples	Latter Hall 2	
Nov 15	Matt Anderson, SDZG-ICR Animal Behavior and Sensory Ecology	Latter Hall 2	Bowler et al. 2016
Nov 22	**THANKSGIVING RECESS**		
Nov 29	Ann Bowles, HSWRI Conservation Bioacoustics	Latter Hall 2	NOAA 2014 Houghton et al. 2015
Dec 6	Research Project Presentations	Latter Hall 2	

* M&B = Martin & Bateson 'Measuring Behavior' text
* SDZG-ICR = San Diego Zoo Global – Institute of Conservation Research
* HSWRI = Hubbs Sea World Research Institute

Text Reading Guided Questions 2017

Week	Chapter	Section
Aug 29-Sept 1	1-An evolutionary approach to animal behavior	Levels of analysis: 8-11
Sept 6-8	2 and 3-Understanding the causes of bird song	(2) Proximate causes: 29-43 (3) Ultimate causes: 43-59
Sept 11-15	4-Development of behavior (Heredity)	Introduction: 64-72 Role of Genes: 76-87
Sept 18-22	5-Development of behavior (Environment)	Role of environment: 87-104
Sept 25-29	6-Control of behavior: Neural mechanisms	
Oct 2-6	7 and 8-Organization of behavior	(7) Neurons hormones: 149-153 (8) Biological rhythms: 153-167
Oct 9-13	9-Behavioral adaptations for survival	pp. 183-202
Oct 16-18	10-Adaptive responses to parasites	Pillars of medicine (Hart 2011)
Oct 23-27	11 and 12-Evolution of feeding behavior	(11) Optimal foraging: 219-228 (12) Waggles & spices: 228-246
Oct 30-Nov 3	13-Choosing where to live	
Nov 6-10	14 and 15-Evolution of communication	(14) Hyena pseudopenis: 287-294 (15) Honest signals: 294-326
Nov 13-17	16-Evolution of reproductive behavior	
Nov 22-24	17-Evolution of mating systems	
Nov 27-Dec 1	18-Evolution of parental care	
Nov 27-Dec 1	19-Evolution of social behavior	
Dec 4-8	20-Evolution and domestication of dogs	Grimm 2015; MacLean & Hare 2015

Classic journal articles in Animal Behavior - 2017

Article #	Citation	Due Date
1	Marler P, Tamura M (1964). Culturally transmitted patterns of vocal behavior in sparrows. Science 146: 1483-1486	Fri Sept 8
2	Garcia J, Koelling RA (1966). Relation of cue to consequence in avoidance learning. Psychon. Sci 4: 123-124.	Fri Sept 22
3	McComb, K (1987). Roaring by red deer stags. Nature 330:648-649.	Fri Sept 29
4	Zach R (1979). Shell dropping: decision-making and optimal foraging in northwestern crows. Behaviour 68:106-117.	Fri Oct 13
5	Mooring MS, McKenzie AA, Hart BL (1996). Grooming in impala: Role of oral grooming in removal of ticks and effects of ticks in increasing grooming rate. Physiology and Behavior 59: 965-971.	Fri Oct 27
6	Andersson M (1982). Female choice selects for extreme tail length in a widowbird. Nature 299:818-820.	Fri Nov 17

Animal Behavior DVD Videos available at Ryan Library DVD section

ORGANIZED BY DISC

Series Title	Call Number	Episodes on Disc
Trials of Life	DVD 1687 disc 1	Arriving, Growing Up, and Finding Food
Trials of Life	DVD 1687 disc 2	Hunting & Escaping, Finding the Way, Homemaking
Trials of Life	DVD 1687 disc 3	Living Together, Fighting, Friends & Rivals
Trials of Life	DVD 1687 disc 4	Talking to Strangers, Courting, Continuing the Line
Life of Birds	DVD 1362 disc 1 - 3	

ORGANIZED BY TOPIC IN ORDER OF COURSE

Title	Time	Call Number
Trials of Life: Arriving	50 min	DVD 1687 disc 1
Trials of Life: Growing up	50 min	DVD 1687 disc 1
Trials of Life: Finding food	50 min	DVD 1687 disc 1
Trials of Life: Hunting and escaping	50 min	DVD 1687 disc 2
Trials of Life: Homemaking	50 min	DVD 1687 disc 2
Trials of Life: Living together	50 min	DVD 1687 disc 3
Trials of Life: Fighting	50 min	DVD 1687 disc 3
Trials of Life: Friends and rivals	50 min	DVD 1687 disc 3
Trials of Life: Talking to strangers	50 min	DVD 1687 disc 4
Trials of Life: Courting	50 min	DVD 1687 disc 4
Trials of Life: Continuing the line	50 min	DVD 1687 disc 4
Trials of Life: Finding the way	50 min	DVD 1687 disc 2
The Life of Birds 3-part series	@ 50 min	DVD 1362 disc 1-3
The Life of Birds: Signals and Songs	50 min	DVD 1362 disc 2, Episode 6

ONLINE RESOURCES

IF YOU FIND ANY EXCELLENT VIDEOS ABOUT ANIMAL BEHAVIOR ONLINE (E.G., YOUTUBE), PLEASE SEND ME THE LINK AND I WILL ADD IT TO THIS LIST AND SHARE IT WITH THE CLASS.