

Physiological Ecology

Fall 2008

BSC 4933/6932

Instructor:

Lynn B. Martin

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Office: SCA 130

Office hours: Tuesdays 2:00-3:00

Time:

12:30 – 1:45

Days:

Tuesdays and Thursdays

Room: CHE 102

Course description:

This course will take an evolutionary approach to understanding animal physiology in natural contexts. It will consist of lectures from the textbook and discussions of readings from the primary literature (most Thursdays). The majority of the course will focus on vertebrates, but microbial and invertebrate physiology will be covered.

Text:

Required: Willmer, Stone, and Johnston. *Environmental Physiology of Animals*. 2nd edition. Blackwell Publishing.

Recommended: Nelson, Randy. *An Introduction to Behavioral Endocrinology*, 3rd edition. Sinauer Press.

Grading:

Undergraduate

Exam I	100 points
Exam II	100 points
Final exam	100 points
Review paper	100 points
Class participation	100 points
Total	500 points

Graduate

Exam I	75 points
Exam II	75 points
Final exam	100 points
Review paper	100 points
Class presentation	100 points
Class participation	50 points
Total	500 points

Grading scale: (No plusses/minuses)

A – 90 and above; B – 89-80; C – 80-79; D – 69-60; F – 59 and below

No extra credit will be given and grades will NOT be curved.

No make-ups or extensions will be made without a valid excuse (hospitalization, military duty, accident). If you believe you are entitled to an extension, you must make your case within 2 days of the assignment due date. Otherwise, you will earn a “0” for that assignment.

Attendance: USF policy mandates that you attend the first class or be dropped from the roster. Other class attendance is at your discretion; however, tardiness will not be

accepted. You will not be allowed to attend a class if you arrive more than 5 minutes late (unless arrangements are made in advance). Consistent late arrival (>3x) will also result in dismissal.

<u>Tentative schedule</u>		
<u>Date</u>	<u>Topic</u>	<u>Readings</u>
August		
26	Syllabus and intro	
28	Why study physiological ecology?	Ch. 1
September		
2	Mechanisms of adaptation	Ch. 2
4	Energy: use and acquisition	Ch. 6
9	Energy: processing and transport	Ch. 7
11	Temperature	Ch. 8
16	The wet: marine	Ch. 11
18	The wet: fresh	Ch. 13
23	The deep and dark (KT Scott)	
25	Exam I	
30	The dry	Ch. 15
October		
2	<i>Student lecture</i>	XXX
7	The hot and the cold	Ch. 16
9	<i>Student lecture</i>	XXX
14	The green	
16	<i>Student lecture</i>	XXX
21	Sensing the world	Ch. 9
23	Exam II	
28	Regulation	Ch. 10
30	<i>Student lecture</i>	<i>allostasis</i>
November		
4	Rhythms of life	Nelson chapter
6	<i>Student lecture</i>	XXX
11	Veteran's Day, no class	
13	Sex and reproduction	Nelson chapter
18	The toxic	
20	<i>Student lecture</i>	<i>endocrine disruption</i>
25	Ecological immunology	primary literature
27	Thanksgiving, no class	
December		
2	Conservation physiology	
4	<i>Student lecture</i>	<i>climate change</i>
6-12	FINALS	

NOTE: Last day to drop course with grade of "W" is November 1, 2008.

Review Paper

Topic due: **October 14, 2008**

Final paper due: **November 25, 2008**

Papers turned in after the due date will not be accepted

This assignment gives you an opportunity to investigate in detail a topic of interest in physiological ecology. The paper should be written in the style of a short review/perspective paper in peer-reviewed scientific literature ("forums" section of many journals or articles in the *Trends* journals). Format for all papers is 5 page of 1.5-spaced, Arial, 10 point, with 1" margins.

Undergraduates:

I. Describe your system/phenomenon of interest. You can probably get much of this from other review papers on the topic. I suggest you find and read carefully at least 3. (~1 page)

II. Propose a novel, viable hypothesis and back it up with peer-reviewed literature. Alternatively, substantiate a hypothesis proposed in the reviews you read. Either option should take an evolutionary ecology approach, in that the proximate and ultimate drivers of the phenomenon should be addressed. (2-3 pages)

III. Summarize your conclusions in context of your initial hypothesis and discuss what other studies or evidence would help further test your ideas. (1 page)

References: You must use references from primary literature, not Wikipedia or the like. This will mean going to the library and using academic journals and books. If you are not comfortable using library resources, please ask librarians for help well in advance!

When you cite a reference, use the formats below. The final paper should include at least 12 references only 3 of which may be reviews. The bibliography is NOT included in the page limit.

Journal example: Kitaysky, A. S., E. V. Kitaiskaia, J. C. Wingfield, and J. F. Piatt. 2001. Dietary restriction causes chronic elevation of corticosterone and enhances stress response in red-legged kittiwake chicks. *Journal of Comparative Physiology B-Biochemical Systemic and Environmental Physiology* 171:701-709.

Book example (include relevant page numbers!): Sapolsky, R. M. 2002. Endocrinology of the Stress-Response. Pp. 409-450 (in J. B. Becker, S. M. Breedlove, D. Crews, and M. M. McCarthy, editors). *Behavioral Endocrinology*. M.I.T. Press, Cambridge.

Graduates:

Follow the guidelines above EXCEPT that your topic must involve your study organism or some aspect of your thesis research. If your work is physiological, then propose a derivation that does not entail the system/critter you study. Also, although you will not be expected to write/read any more, the quality and content of your writing will be held to higher standards than undergraduates.

Graduate student presentations

Once per semester, each graduate student will lead a discussion of 1-2 papers from the primary literature relevant to the lecture topic the prior day. The goal is to give incipient educators the opportunity to present complicated information with which you are unlikely familiar, a common task in academia for which you typically receive little training. For each topic, papers will be assigned in some cases. In most, you may choose papers, although they must be approved by the instructor at least 2 weeks in advance of class.

Steps:

1. Choose a date/topic by September 18
2. Choose 1-2 papers that cover your topic; only 1 if a review paper. Ideally the topic will entail a "hot" area in ecophysiology and something with which you are unfamiliar.
3. Give your presentation
 - ½ the class: review the paper in PowerPoint format
 - ½ the class: generate and maintain discussion of the paper and related topics

You will be evaluated on the quality of the presentation (2/3) and the discussion (1/3). Under no circumstances will an absence on the day of your presentation be excused; you will receive a '0' if you miss it. Once your date is selected, it cannot be changed.

Student participation

Participation in discussions will be integral to your success in the class (1/5 of your grade). For this reason, you will be awarded points based on your efforts in discussions of the primary literature led by myself and/or graduate students. As attendance will be assumed, points will be earned through questions about the presented material, suggestions about future directions, and critiques of ideas in the literature or those of your peers or me. Scores at the end of each session will be available immediately, but will not be negotiable. Note: you will be evaluated on both the quality and quantity of your contributions.

Graduate students will be held to the same expectations, although the total points they can earn from these discussions will be one half of the undergraduate values.

Other important notes:

1. Students who anticipate missing class due to a religious observance must submit notification in writing by the third class. Other absences are not excusable.
2. The content of the course is the sole property of the instructor and may not be reproduced or distributed in any form for sale.
3. Assignment dates and lecture content are subject to change. Changes will be announced no later than one class prior to the change, so your attendance is critical.
4. S-U grades must be negotiated in writing within the first three weeks of the term.
5. An "I" grade indicates incomplete course work and may only be awarded when only a small portion of coursework is incomplete and when the student otherwise has a passing grade. A Biology department "Incomplete Grade Contract" must be completed before the "I" grade is given.

6. No cell phones, PDAs, laptops or other electronic devices are allowed in the classroom. Any use of these devices is grounds for dismissal from the class that day; second offenses will result in permanent dismissal.

7. Disruption of academic process is an act by a student in a classroom or teaching environment which in the reasonable estimation of a faculty member: i) distracts attention from the academic material (e.g., persistent, disrespectful or abusive disruptions), or ii: presents danger to the health, safety or well-being of class participants. These acts will not be tolerated.

8. Uncollected assignments will not be retained longer than 90 days from the due date. Grades cannot be disputed beyond 90 days from their assignment.

9. Academic dishonesty will not be tolerated and you will be held to all academic policies and standards of the USF. Plagiarism detection software (e.g., SafeAssign) may be used on your assignments.