

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>COURSE CHANGE REQUEST</b> <b>Graduate Programs</b>	UGPC Approval _____ UFS Approval _____ SCNS Submittal _____
	Department Biological Sciences College Charles E. Schmidt College of Science	Confirmed _____ Banner Posted _____ Catalog _____
<b>Current Course Prefix and Number</b> PCB 6749	<b>Current Course Title</b> Environmental Physiology	
<i>Syllabus must be attached for ANY changes to current course details. See <a href="#">Guidelines</a>. Please consult and list departments that may be affected by the changes; attach documentation.</i>		
<b>Change title to:</b>  <b>Change prefix</b> From:                      To:  <b>Change course number</b> From: 6749C              To: 6749  <b>Change credits*</b> From: 4                      To: 3  <b>Change grading</b> From:                      To:	<b>Change description to:</b> Please see attached memo with requested change.  <b>Change prerequisites/minimum grades to:</b>  <b>Change corequisites to:</b>  <b>Change registration controls to:</b>  Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.	
<b>Effective Date</b> <small>(TERM &amp; YEAR)</small> Spring 2019	<b>Terminate course</b> <b>List final active term</b>	
<b>Faculty Contact/Email/Phone</b> Sarah Milton/smlton@fau.edu/561-297-3327		
<b>Approved by</b> Department Chair _____ College Curriculum Chair _____ College Dean _____ UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____	<b>Date</b> 9-20-18 10-29-18 10-29-18 11-14-18 11/14/18 11/15/18	

Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) one week before the UGPC meeting.

GRADUATE COLLEGE

OCT 30 2018

Received



Charles E. Schmidt College of Science  
Department of Biological Sciences  
777 Glades Road  
Boca Raton, FL 33431  
tel: 561.297-3320  
fax: 561.297-2749

May 24, 2018

TO: Members of the Graduate Faculty

This request is to reduce the credit hours and class designation for Environmental Physiology (PCB6749C) from a 4cr "combined" class to a 3cr lecture only course (PCB4769). The 2hr assigned period for lecture/lab is too short to carry out a laboratory exercise at the graduate level; I have been making the 4<sup>th</sup> credit through a journal club attached to the normal lecture period. However, Journal club experience can be obtained elsewhere in the graduate curriculum, and a 3 credit course would allow for greater flexibility in the students' graduate curricula.

Sincerely,

A handwritten signature in cursive script that reads "Sarah L. Milton".

Sarah L. Milton, Ph.D.  
Associate Professor  
Dept. of Biological Sciences, FAU

**GRADUATE COLLEGE**

**OCT 30 2018**

Received

**ENVIRONMENTAL PHYSIOLOGY**  
TR 2:00 – 3:50 CM 125//LA 220/MC 209

3 cr hours

PCB 6749()  
Spring 2019

Dr. Milton

[smilton@fau.edu](mailto:smilton@fau.edu)

SC 288 and/or hypoxia lab SC 284

phone: 7-3327

Office hours: TR 11-12

**Description:** This class will examine how animals function in and respond to their natural environments, i.e. the study of animals in their natural habitat, with reflections on behavioral strategies, ecology, and evolution. The initial part of the course will look at specific physiological challenges faced by animals in different environments (e.g. salt and water balance), the second part of the class will look at how animals adapt to specific environments. We will utilize both the textbook and recent journal articles as source material.

**Objectives:**

1. To develop an integrated understanding of how organisms adapt through evolution to withstand the challenges posed by a variety of marine, freshwater, and terrestrial environments
2. To understand the functions of cells, tissues, organs, and organ systems in multicellular animals (both vertebrates and invertebrates) which help to maintain homeostasis, by investigating the mechanisms that operate in living organisms at all levels ranging from molecules to the whole organism.
3. To improve scientific communication skills including data interpretation, presentation, and writing at the graduate level

**Course Prerequisites:** none, undergraduate physiology course recommended

**Text:** Environmental Physiology of Animals. Willmer, P., G. Stone, and I. Stone. Blackwell Science, London.

Additional readings: include background journal articles, indicated in the syllabus with a capital letter, that are meant to enhance the text where discussion in the text is not sufficient for the class

**Academic Integrity:** Cheating will not be tolerated and may reflect badly in your future professional career. A student found to be cheating on an exam or plagiarizing a report will receive a zero on that exam or report. Cheating may result in disciplinary action. The use of cell phones, pagers or other electronic devices is strictly prohibited during an exam.

**Problem Solving:** If you have a problem, question, complaint or concern the first person to see is your instructor.

**Class Conduct:** It is expected that all class members will exhibit respectful and courteous behavior in their words and actions during class sessions and in all interactions with other students, faculty, staff and graduate teaching assistants. Examples of respectful behavior include the following:

- § Turning off cell phones and pagers when entering the classroom.
- § Using computers only for lecture-related material
- § Putting away newspapers and other reading materials unrelated to class.
- § Arriving in the classroom on time so that the class session is not interrupted by tardiness.

**Disability Policy Statement:** In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at [www.fau.edu/sas/](http://www.fau.edu/sas/).

**FAU Attendance Policy Statement:** Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performance and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and with a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

## **Counseling and Psychological Services (CAPS) Center**

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

**Code of Academic Integrity policy statement:**

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](https://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf). [https://www.fau.edu/ctl/4.001\\_Code\\_of\\_Academic\\_Integrity.pdf](https://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf)

**Religious Accommodations:**

Students who wish to be excused from coursework, class activities or examinations must notify the instructor in advance of their intention to participate in religious observation and request an excused absence.

<u>DATE</u>	<u>LECTURE TOPIC</u>	<u>READING</u>
WEEK 1	Intro, homeostasis Adaptation	Ch 1 & 2 “
WEEK 2	Size, scaling water, ion balance	Ch 3, A,B, *1 Ch 4, *2
WEEK 3	osmoregulation and excretion “	Ch 5. , *3 Ch 10.2,11.1, 11.2, *4
WEEK 4	respiration and circulation gas exchange	Ch 7, *5 and *5a Ch 7, *6 and *6a
WEEK 5	respiratory pigments PAPER PROPOSAL DUE (1-2 para) Diving	Ch 7, C,D, *7 *8, *8a
WEEK 6	anoxia tolerance (invertebrates) anoxia tolerance (vertebrates)	E, *9 F,G, *10
WEEK 7	Thermoregulation heat balance / feeding	Ch 8, *11 Ch 6, *12
WEEK 8	exercise, freezing <b>MIDTERM EXAM</b>	Ch 13, H, *13
WEEK 9	hibernation high altitude	I, *14 Ch 14, K,L,M, *18 *18a
WEEK 10	polar environments deep sea environments OUTLINE due (2-3 pp)	Ch 9, J, *15
WEEK 11	hydrothermal vents desert environments	*16 *17
WEEK 12	climate change climate change	N, *19 O, *20
WEEK 13	ecotoxicology ecotoxicology	P,Q, *21 and *21a R,S,T, *22, and *22a
WEEK 14	TBA <i>THANKSGIVING BREAK!!</i>	

WEEK 15	Presentations of papers Presentations of papers
WEEK 16	<b>Papers due</b> (10-12 pp) <b>FINAL EXAM</b> 10:30 – 1:00 (NOTE TIME CHANGE!)

**Grading:**

Grades will be based on the following:

Midterm exam	25%
Final exam	25%
Paper outline	5%
Paper (written)	25%
Paper (presentation)	15%
Class participation/attendance	5%

Paper: The written paper will address a physiological problem and its solution, on the animal(s) of your choice; this can be a problem related to your thesis research or something completely different. The paper should be approximately 10-12 pages long (1.5 spacing, Times New Roman (12 pt), Courier, or Arial (11 pt) text, no more than 1 inch margins) and include a bibliography (not in the page limit). Also, only 1 figure may be included in the page limit, though more than one figure may certainly be included. A 2-3 page outline of the paper should be submitted no later than Oct. 25th. A topic (one paragraph) is due for approval Sept 20th. The last two class session prior to the final exam will be devoted to classroom (powerpoint) presentations of your paper, which should be 20-25 mins long, including 3-4 mins for questions (No, don't make a short talk and hope for lots of questions!).

**ADDITIONAL REQUIRED BACKGROUND READINGS:**

- A) **Buffenstein et al., 2008.** The oxidative stress theory of aging: embattled or invincible? Insights from non-traditional model organisms. *AGE*, 30(2-3):99-109.
- B) **DeLong JP, Okie JG, Moses ME, Sibly RM, Brown JH.** Shifts in metabolic scaling, production, and efficiency across major evolutionary transitions of life. *Proc Natl Acad Sci U S A.* 2010 Jul 20;107(29):12941-5.
- C) **Storz JF, Moriyama H.** Mechanisms of hemoglobin adaptation to high altitude hypoxia. *High Alt Med Biol.* 2008 Summer;9(2):148-57. Review
- D) **Burmester T, Hankeln T.** Function and evolution of vertebrate globins. *Acta Physiol (Oxf).* 2014 Jul; 211(3):501-14.
- E) **Storey KB, Lant B, Anozie OO, Storey JM.** Metabolic mechanisms for anoxia

tolerance and freezing survival in the intertidal gastropod, *Littorina littorea*. *Comp Biochem Physiol A Mol Integr Physiol*. 2013 Aug;165(4):448-59.

- F) **Storey, KB and Storey, JM.** Molecular biology of freezing tolerance. *Compr Physiol*. 2013 Jul;3(3):1283-308. Review.
- G) **Larson J, Drew KL, Folkow LP, Milton SL, Park TJ.** No oxygen? No problem! Intrinsic brain tolerance to hypoxia in vertebrates. *J Exp Biol*. 2014 Apr 1;217(Pt 7):1024-39.
- H) **Storey KB, Storey JM.** Tribute to P. L. Lutz: putting life on 'pause'--molecular regulation of hypometabolism. *J Exp Biol*. 2007 May;210(Pt 10):1700-14. Review.
- I) **Dave KR, Christian SL, Perez-Pinzon MA, Drew KL.** Neuroprotection: lessons from hibernators. *Comp Biochem Physiol B Biochem Mol Biol*. 2012 May;162(1-3):1-9. Review.
- J) **Zarubin M, Belkin S, Ionescu M, Genin A.** Bacterial bioluminescence as a lure for marine zooplankton and fish. *Proc Natl Acad Sci U S A*. 2012 Jan 17;109(3):853-7.
- K) **Sunday JM, Bates AE, Kearney MR, Colwell RK, Dulvy NK, Longino JT, Huey RB.** Thermal-safety margins and the necessity of thermoregulatory behavior across latitude and elevation. *Proc Natl Acad Sci U S A*. 2014 Apr 15;111(15):5610-5.
- L) **Molenda O, Reid A, Lortie CJ.** The alpine cushion plant *Silene acaulis* as foundation species: a bug's-eye view to facilitation and microclimate. *PLoS One*. 2012;7(5):e37223.
- M) **Peck LS, Morley SA, Richard J, Clark MS.** Acclimation and thermal tolerance in Antarctic marine ectotherms. *J Exp Biol*. 2014 Jan 1;217(Pt 1):16-22.
- N) **Hansen J, Kharecha P, Sato M, Masson-Delmotte V, Ackerman F, Beerling DJ, Hearty PJ, Hoegh-Guldberg O, Hsu SL, Parmesan C, Rockstrom J, Rohling EJ, Sachs J, Smith P, Steffen K, Van Susteren L, von Schuckmann K, Zochos JC.** Assessing "dangerous climate change": required reduction of carbon emissions to protect young people, future generations and nature. *PLoS One*. 2013 Dec 3;8(12):e81648.
- O) **Pörtner HO, Peck MA.** Climate change effects on fishes and fisheries: towards a cause-and-effect understanding. *J Fish Biol*. 2010 Nov;77(8):1745-79.
- P) **Sonne C.** Health effects from long-range transported contaminants in Arctic top



predators: An integrated review based on studies of polar bears and relevant model species. *Environ Int.* 2010 Jul;36(5):461-91.

- Q) **Whitehead A.** Interactions between oil-spill pollutants and natural stressors can compound ecotoxicological effects. *Integr Comp Biol.* 2013 Oct;53(4):635-47. Review.
- R) **R.H. Gee, A. Charles, N. Taylor, P.D. Darbre.** Oestrogenic and androgenic activity of triclosan in breast cancer cells. *J Appl Toxicol*, 28 (2008), pp. 78–91
- S) **Newbold et al.,** 2009. Prenatal exposure to bisphenol at environmentally relevant doses adversely affects the murine female reproductive tract later in life. [Environ Health Perspect.](#) 2009 Jun;117(6):879-85.
- T) **Marsee et al.,** 2006. Estimated daily phthalate exposures in a population of mothers of male infants exhibiting reduced anogenital distance. [Environ Health Perspect.](#) 2006 Jun;114(6):805-9.