

# FLORIDA ATLANTIC UNIVERSITY™

## Undergraduate Programs—COURSE CHANGE REQUEST<sup>1</sup>

UUPC APPROVAL \_\_\_\_\_  
 UFS APPROVAL \_\_\_\_\_  
 SCNS SUBMITTAL \_\_\_\_\_  
 CONFIRMED \_\_\_\_\_  
 BANNER POSTED \_\_\_\_\_  
 CATALOG \_\_\_\_\_

DEPARTMENT: **BIOLOGICAL SCIENCE**

COLLEGE: **COLLEGE OF SCIENCE**

COURSE PREFIX AND NUMBER: **PCB 4723**

CURRENT COURSE TITLE: **COMPARATIVE ANIMAL PHYSIOLOGY**

CHANGE(S) ARE TO BE EFFECTIVE (LIST TERM): **FALL 2013**

\_\_\_ TERMINATE COURSE (LIST FINAL ACTIVE TERM):

CHANGE TITLE TO:

CHANGE DESCRIPTION TO:

CHANGE PREFIX FROM: \_\_\_\_\_ TO: \_\_\_\_\_

CHANGE PREREQUISITES/MINIMUM GRADES TO\*:

CHANGE COURSE NO. FROM: \_\_\_\_\_ TO: \_\_\_\_\_

EXISTING

BSC 1010, BSC1010L, BSC 1011, BSC 1011L, CHM 2210, CHM 2211, PHY 2048, PHY 2049 or PHY 2053, PHY 2054.

CHANGE CREDITS<sup>2</sup> FROM: \_\_\_\_\_ TO: \_\_\_\_\_

NEW PRE/REQ.

BSC 1010, BSC1010L, BSC 1011, BSC 1011L, CHM 2045, CHM 2045 L, CHM 2046, CHM 2046L, CHM 2210, CHM 2211

CHANGE GRADING FROM: \_\_\_\_\_ TO: \_\_\_\_\_

CHANGE WAC/GORDON RULE STATUS<sup>3</sup>  
 ADD\* \_\_\_\_\_ REMOVE \_\_\_\_\_

MINIMUM PASSING GRADE C-

CHANGE GENERAL EDUCATION REQUIREMENTS<sup>4</sup>  
 ADD\* \_\_\_\_\_ REMOVE \_\_\_\_\_

EXISTING COREQUISITES:

\*WAC and General Education criteria must be clearly indicated in attached syllabus. For WAC Guidelines: [www.fau.edu/WAC](http://www.fau.edu/WAC). Please attach General Education Course Approval Request: [www.fau.edu/deanugstudies/GeneralEdCourseApprovalRequests.php](http://www.fau.edu/deanugstudies/GeneralEdCourseApprovalRequests.php)

CHANGE COREQUISITES TO\*:

CHANGE REGISTRATION CONTROLS TO:

Attach syllabus for ANY changes to current course information.

Should the requested change(s) cause this course to overlap any other FAU courses, please list them here.

Please consult and list departments that might be affected by the change(s) and attach comments.<sup>5</sup>

Faculty contact, email and complete phone number:

David Binninger; binninge@fau.edu; 561.297-3323

**Approved by:**

Department Chair: David Binninger

**Date:**

Feb. 27, 2013

College Curriculum Chair: J E My

3/21/13

College Dean: DB John

3/20/13

UUPC Chair: JF My

3/22/13

Undergraduate Studies Dean: Samuel Smith

3/27/13

UFS President: \_\_\_\_\_

Provost: \_\_\_\_\_

1. Syllabus must be attached; syllabus checklist recommended; see guidelines and checklist: [www.fau.edu/academic/registrar/UUPCinfo](http://www.fau.edu/academic/registrar/UUPCinfo)

2. Review Provost Memorandum: Definition of a Credit Hour [www.fau.edu/provost/files/Definition\\_Credit\\_Hour\\_Memo\\_2012.pdf](http://www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf)

3. WAC approval (attach if necessary)

4. Gen. Ed. approval (attach if necessary)

5. Consent from affected departments (attach if necessary)

## Syllabus

**Comparative Animal Physiology PCB 4723-CRN# 13158 Fall 2013**  
TR 12:30 – 1:50      3 cr hours      PA 101

**Course Prerequisites:** BSC 1010, BSC 1010L; BSC 1011, BSC 1011L, CHM 2045, CHM 2045L, CHM 2046, CHM 2046L, CHM 2210, CHM 2211,  
Minimum grade of C-

**Co-requisite:** PCB 4723L

### **Dr. Milton**

Sanson Science Rm 288

Phone: 297-3327

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

Office hours: Tuesday 2:30-3:30, Thursday 10-12:00, or by appointment

TA contact information will be provided in your laboratory section.

**Comparative Animal Physiology** will address the biochemistry and physiology of (mostly) vertebrate animals through both lecture and laboratory work. Animal physiology focuses on the functions of tissues, organs, and organ systems in multicellular animals, investigating the mechanisms that operate in living organisms at all levels ranging from molecules to the whole organism. Animal physiology is thus an integrative science, attempting to bring together everything that is known about an animal's function to create an integrated picture of how that animal operates in its environment.

Highlighted are the mechanisms of function and the regulatory processes responsible for maintaining body function. The course will describe the mechanisms of how the nervous system integrates information and regulates motor output, and how the respiratory, the cardiovascular, and the renal systems, operate to bring about homeostasis. The homeostatic mechanisms will be described at various levels of the organization, from molecules and proteins, to cells and tissues, and to the behavior of the intact organism (where appropriate), and in this context how animals deal with the problems of oxygen, water, temperature, and waste products. We will investigate these various topics in the laboratory through a combination of computer and 'wet' activities. The emphasis of the lab will be on communication: data interpretation, presentation, and professional writing, as these are requisite skills for any future career. Students will not only be expected to memorize the factual content but be able to analyze new data and apply concepts from diverse lectures to address novel questions.

**Grading:** The lecture part of this course will have four, non-cumulative exams of approximately 75-80 pts each, which will be a combination of multiple choice/matching (on scantrons) and short answer/short essay (written). You will need to bring your OWN scantron (blue, 8.5 x 11") for each exam. There will also be some sort of active, in class work on most days, which will be worth 2 to 5 pts apiece – these add up, so don't blow off class because it is only a few points! The active learning events are to review material and sharpen your critical thinking skills, as well as work on things like graph

interpretation that you will see on exams. Written homework may also be assigned at the discretion of the instructor.

Thus the total number of possible points will be about 350-400; your grade will depend on the percentage of points you earn out of the total possible. There is usually a curve, with the class average set to a high “C” grade, but this depends on how well the class as a whole does (grades are not curved downward).

**Be on time for the exams.** Students who arrive late will not receive extra time to complete an exam. Once the first student has completed and turned in an exam, no additional late students will be admitted. Those who are not admitted or present for an exam will receive a grade of zero for that test regardless of the excuse. If a student misses an exam, they must notify the instructor by email within 2 days of the missed test and provide a valid excuse along with the proper documentation as defined by the FAU Academic Policies and Regulations ([http://www.fau.edu/academic/registrar/09-10\\_catalog/academics.html](http://www.fau.edu/academic/registrar/09-10_catalog/academics.html)). A student with a valid excuse and proper documentation may make up a single missed exam by taking a written exam within one week of the missed exam; makeup exams are *more difficult* than the original exam. There is no make-up for missed in class work, I-clicker quizzes, or extra credit.

Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities. These students will be allowed to make up missed work without any reduction in the student’s final course grade. Reasonable accommodation will also be made for students participating in a religious observance. Also, note that grades of Incomplete (“I”) are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of “I” will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU’s University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

**Clickers:** Some of the active learning events will require clickers to participate. Every student in the class is required to have a clicker – “I-clicker” (thin, white) brand. These are available in the bookstore. If you already have one for another class, you can use the same one for this class. Once you purchase a clicker, please go on-line to the I-clicker website and register it PRIOR to the first day of class – you may want to repeat this to be sure you are registered for this class even if you have done it before. Sometimes the registrations disappear from the system..... You need to register the clicker number (on the back of it) and your **Z-number** (since that is how you are registered on my class list, PLEASE INCLUDE the actual “Z” when you register). Please bring the clicker to every class, since you don’t know what days they will be needed. Students are responsible for having a working iclicker in class each day, including a working battery! “I FORGOT” means you get a zero for the class points that day – if you can remember your cell phone, you can remember your iclicker!

- I-clicker, the regular I-clicker or I-clicker 2 will suffice. **The mobile I-clicker app will NOT be used or accepted**

**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 (ADA) students who require reasonable accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) – in Boca Raton SU 133 (561-297-3880); in Davie, LA 240 (954-236-1222) and follow all OSD procedures.

**Code of Academic Integrity:** Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at [http://www.fau.edu/ctl/4.001\\_Code\\_of\\_Academic\\_Integrity.pdf](http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf)

**Text: Animal Physiology: From genes to organisms.** By Sherwood, Klandorf, and Yancey. Readings will be from this text and as assigned. 5-10% of the exam questions will BE FROM THE TEXT (that is, NOT material covered in lecture, so read your books!). Additional required journal articles (in **bold**, below) are accessible on-line (through PubMed, see below, and Blackboard). Please read these during the **week they are scheduled** on the syllabus, as they are intended to enrich a particular topic. They do not ALL have to be read prior to the first exam! The lab manual is also available through Blackboard for this class. You will need to PRINT UP YOUR OWN copy (This saves a LOT of money for you in photocopying costs).

Students are expected to complete readings and homework as assigned. Studying and coursework should occupy approximately 2 hours of outside time for each hour spent in class.

The schedule of topics and assigned readings is subject to change during the semester, depending on the needs of the class. Changes will be announced in class and via Blackboard.

DATE	Lecture	Reading Assignments	Lab
Jan. 8	Homeostasis <b>BRING YOUR TEXT BOOK TO THE FIRST DAY OF CLASS</b>	Ch 1	How to Read a Scientific Paper, Intro to Medline
10	Proteins and molecular biology	Ch 2 <b>Nishiguchi et al. 2011</b>	
15	Membranes	Ch 3	How to Write a Scientific Paper – in class workshop on graphing and writing
17	Membranes II		
22	Nerves I	Ch 4	Neurophysiology of Nerve Impulses – computer simulation PhysioEx #3
24	Nerves II		
29	Senses: Eyes & vision	Ch 6 -> p. 220 <b>Oliver et al., 2000</b>	Stretch receptors lab
31	Senses: Mechanoreceptors	pp. 221-241	
Feb 5	Senses: Special senses	pp. 241-249 <b>Walcott, 1996</b>	Build your own Homonculus!
<b>Feb 7</b>	<b>EXAM I thru Mechanoreceptors</b>		
12	Cardiac physiology I	Ch 9	Heart Dissection and EKG, PhysioEx exercise
14	Cardiac Physiology II		
19	Pulmonary I	Ch 11	Respiration / Respiratory System Mechanics: PhysioEx
21	Pulmonary II		
26	Pulmonary III (non-mammals)	<b>Sollid et al., 2003</b>	Walking lab: How to design a scientific experiment
<b>Feb 28</b>	<b>Exam II Special senses thru Pulmonary III</b>		
<b>March 4-10</b>	<b>SPRING BREAK ☺</b>		

12	Respiratory pigments	Ch 11 pp. 498-end	Oxygen dissociation of erythrocyanin
14	Dealing with Anoxia	Ch 2 pp. 44-55	
19	Diving	<b>Williams et al. 2000</b>	Anoxia tolerance in fruit flies
21	Scaling and heat balance	Ch 15, <b>Secor, 2003</b>	
26	Hibernation	Ch 15 <b>Kauffman et al., 2004</b>	Diving lab 1
Mar 28	Muscles	Ch 8	
<b>April 2</b>	<b>EXAM III (through muscles)</b>		Diving lab 2
4	Locomotion		
9	Osmoregulation	Ch 13 -> p. 595	Fluid balance and kidney function
11	Kidneys I	Ch 12	
16	Kidneys II	<b>Dawson et al., 2006</b>	Mini-symposium of last 4 labs
18	Fluid balance		
23	<b>Review</b>		No labs
<b>April 25</b>	<b>Final Exam</b>	NOTE CHANGE IN TIME FOR EXAM!	<b>10:30-12:00</b>

**Journal Readings:** Journal readings are meant to provide you with a greater understanding of a topic than is provided by the textbook, as well as continue to familiarize you with the format of scientific papers and introduce you to some interesting research that lies behind the textbook writing. These articles are accessible through the internet – you may access them from Blackboard or through the search engine Medline.

To use Medline, go to FAU home page, to “Libraries”. Click on electronic databases, and pick “M” (for Medline). Note that there are 3 different Medlines. They require going through the Proxy server if you are not on a campus computer (for which you will need your OwlCard). You can search by authors, title, etc. A combination of an author or 2 and a key word from the title will often narrow your search down to just a couple of responses, making it much easier to find the article of interest. These readings are NOT for studying and memorizing, just to get you used to reading and dealing with journal articles and scientific style. **HOWEVER**, there will be a few questions on the journal readings on the tests, so don’t blow them off!

**Dawson, T.J.,** McTavish, K.J., Munn, A.J., and Holloway, J. 2006. Water use and the thermoregulatory behaviour of kangaroos in arid regions: insights into the colonisation of arid rangelands in Australia by the Eastern Grey Kangaroo (*Macropus giganteus*). *Journal of Comparative Biochemistry and Physiology B*, **176(1)**: 45-53.

- Kauffman**, A.S., Paul, M.J., and Zucker, I. 2004. Increased heat loss affects hibernation in golden-mantled ground squirrels. *American Journal of Physiology Regul. Integr. Comp. Physiol.* 287(1): R167-R173.
- Nishiguchi Y**, Abe F, Okada M. Different pressure resistance of lactate dehydrogenases from hagfish is dependent on habitat depth and caused by tetrameric structure dissociation. *Mar Biotechnol (NY)*. 2011 Apr;13(2):137-41.
- Oliver**, LJ, Salmon, M, Wyneken, J, Hueter, R, and Cronin TW. 2000. Retinal anatomy of hatchling sea turtles: anatomical specializations and behavioural correlates. *Marine and Freshwater Behavior and Physiology* **33**: 233-248.
- Secor SM**. 2003. Gastric function and its contribution to the post-prandial metabolic response of the Burmese python *Python molurus*. *J. Exp. Biol.* **206(10)**: 1621-30.
- Sollid J**, De Angelis P, Gundersen K, Nilsson GE. Hypoxia induces adaptive and reversible gross morphological changes in crucian carp gills. *J Exp Biol.* 2003 Oct;206(Pt 20):3667-73.
- Walcott**, C. 1996. Pigeon homing: observations, experiments and confusions. *Journal of Experimental Biology.* **199(1)**: 21-27. (Note – this guy is the granddaddy of pigeon homing)
- Williams TM**, Davis RW, Fuiman LA, Francis J, Le Boeuf BJ, Horning, Calambokidis J, and Croll DA. 2000. Sink or swim: strategies for cost-efficient diving by marine mammals. *Science* 288(5463): 133-6.