

**PSYC 8970  
Advanced Biological Psychology  
Syllabus  
Summer 2009**

<b>Course:</b>	<b>Advanced Biological Psychology (PSYC 8970)</b>
<b>Semester:</b>	<b>Summer 2009</b>
<b>Meeting Times:</b>	<b>Tuesday, Thursday. 9:45-11:30</b>
<b>Location:</b>	<b>Haley Center, Room 3034.</b>
<b>Instructor:</b>	<b>Christopher Newland, Ph.D. 110 Thach, 844-6479 <a href="mailto:newlamc@auburn.edu">newlamc@auburn.edu</a> <a href="http://www.duc.auburn.edu/~newlamc/personal">http://www.duc.auburn.edu/~newlamc/personal</a></b>
<b>GTA</b>	<b>Jordan Bailey Bailej2@auburn.edu</b>
<b>Office Hours</b>	<b>Newland: 8:30-9:30, T, Th, or by appointment. Bailey: TBA.</b>
<b>Text</b>	<b>Biological Psychology. Rosenzweig, Breedlove, and Watson. 5<sup>th</sup> Edition. (2007) Selected Readings to be made available</b>

**Overview and Course Objectives.** This course will cover some of the many relationships between the brain and behavior. My goal is to introduce the material and provide a foundation that will enable you to go further with it as opportunities arise. We will cover the basic principles and how they contribute to our understanding of specific systems (e.g., vision, learning) or sets of problems (e.g., substance abuse, behavior disorders). I trust that you already know something about how behavior is established, maintained and organized. We will cover the the fundamental units of the nervous system (the neuron and the synapse), structure of the nervous system, the different dimensions along which structure falls (e.g., physical, chemical), the function of different components of the central nervous system, and the neurobehavioral bases of selected behavior disorders.

The text is an exceptionally clearly written one so I will rely on you to do much of the reading on your own. I have chosen some supplemental readings to identify interesting new trends in the behavioral neurosciences or because they illustrate how research is conducted in this area.

Some of this is difficult material, especially the first time through (and we will go fast), but it is within reach. I advise you to come to class prepared and to resist mightily the temptation to procrastinate. Read the assignment once before class, perhaps in one sitting. The first reading need not be to memorize details but rather to get an overview of what is in the chapter. Keep up with the material as we go through it in class. Read the chapter before exams and that reading should be for detail. I advise that when reading the chapter the second time you pause at the end of each section and summarize it using words and *complete* sentences that include *their* fundamental units: nouns, verbs, adverbs, etc. Pretend you are teaching it to someone else and, using the correct terms and experiments, explain what was in the chapter.

By the end of the semester you should:

- Be able to describe the major features of the brain and spinal cord and how they contribute functionally to the behaving organism.
- Understand the resting potential and action potential of neurons and the role of ion transport in producing these.
- Understand how synaptic events, especially neurotransmission, contribute to our understanding of drugs and of some behavioral disorders.
- Understand the general principles of sensory function from receptor to CNS integration.
- Understand integrative systems such as those involved in homeostasis and behavioral plasticity,
- Understand how genetics, environment, and the nervous system contribute to normal and abnormal function.
- Describe the roles of environment and genetics in developmental disabilities.
- Be able to describe some experimental approaches to behavioral neuroscience.
- Describe some of the basic principles of nervous system development across the lifespan (early development and aging)
- Appreciate how behavior and the other neurosciences jointly contribute to our understanding brain/behavior relationships.

**Evaluation.** Your grade from this section will be an average taken from the four in-class exams.

**Course Structure.** The course (and quizzes) will be draw heavily from the textbook and readings. Class time will be used partly to cover material from the textbook, especially material that might be difficult to get from the book alone. For this I will need your help in letting me know what parts of the book you find difficult. I also hope to use some class time to extend the discussion in the textbook either to cover a topic in a little more depth or to discuss a point raised by the authors.

**Academic Honesty.** Cheating is theft and a betrayal of the good-faith required for higher education to function. It will not be tolerated and will be dealt with according to the policies established in the Tiger Cub. You are expected to do your own work on quizzes but, of course, you may study together for quizzes.

**Students with Disabilities.** Students who need accommodations are asked to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. Bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have an Accommodation Memo but need accommodations, make an appointment with The Program for Students with Disabilities, 1244 Haley Center, 844-2096.

**PSYC 8970: Advanced Biological Psychology**  
**Lecture Schedule: Summer, 2009**

<b>WEEK OF</b> (MONDAY'S DATE)	<b>WEEK #</b>	<b>TOPIC</b>	<b>ASSIGNMENT.</b>
25 May 09	1	Origins of Neuroscience, Consciousness, Reductionism. Ethics of Animal research. Neurons and Glia Neural Structure	Chapter 1.  Chapter 2
1 Jun 09	2	Neural Structure Ion channels Resting potential, Action potential	Chapter 2 Chapter 3
8 Jun 09	3	EXAM 1. THURS, 11 JUN 2009 Chapt 1,2,3 (part) (National Academy Meeting)	
15 Jun 09	4	Synapses, Monitoring electrical activity.  Chemical Bases of Behavior.	Chapter 3 Chapter 4
22 Jun 09	5	Evolution of Brain and Behavior.  Concepts in Evaluating Evolutionary Contributions to Behavior.	Appx. Chapt. 6 [1]
		Development	Chapter 7.
29 Jun 09	6	Development EXAM 2. THURSDAY. 2 JUL 2009 Chapt 3,4,6,7, appx., readings.	Chapter 7
6 Jul 09	7	General Principles of Sensory Processing Vision. Constraint-Induced Stroke Therapy	Chapter 8 Chapter 10. [2, 3]
13 Jul 09	8	Homeostasis Biological rhythms.	Chapter 13 Chapter 14
20 Jul 09	9	EXAM 3. THURSDAY 23 JUL 2009. Chapt. 8, 10, 13,14 readings. Psychopathology	Chapter 16
27 Jul 09	10	Learning and memory: Biological perspectives Learning and memory: Neural mechanisms. (LAST DAY OF CLASS 30 JUL)	Chapter 17 [4]
<b>FINAL EXAM: THURSDAY 6 Aug. 12:00-2:30.</b>			

1. Papini, M. R. (2002). Pattern and process in the evolution of learning. *Psychological Review*, *109*, 186-201.
2. Taub, E., Crago, J. E., Burgio, L. D., Groomes, T. E., Cook, E. W., 3rd, DeLuca, S. C., & Miller, N. E. (1994). An operant approach to rehabilitation medicine: Overcoming learned nonuse by shaping. *Journal of the Experimental Analysis of Behavior*, *61*, 281-293.
3. Gauthier, L. V., Taub, E., Perkins, C., Ortmann, M., Mark, V. W., & Uswatte, G. (2008). Remodeling the brain: Plastic structural brain changes produced by different motor therapies after stroke. *Stroke*, *39*, 1520-1525.
4. Schultz, W., Tremblay, L., & Hollerman, J. R. (2000). Reward processing in primate orbitofrontal cortex and basal ganglia. *Cerebral Cortex*, *10*, 272-284.