

Psychology 7100

Biological Basis of Behavior

Spring 2008

Instructor: Kristina J. Watson, PhD

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Office hours: by appointment

Office: 301 Biotechnology (northwest corner)

Course Location: FAV 262

Course Time: Tuesdays and Thursdays, 3:00 – 4:15 PM

Required Textbooks:

Carlson, N.R. (2007). *Physiology of behavior* (9th ed.). Boston: Allyn & Bacon.

Pinel, J.P.J., & Edwards, M.E. (2008). *A colorful introduction to the anatomy of the human brain: A brain and psychology coloring book* (2th ed.). Boston: Allyn & Bacon.

Additional readings as applicable.

Optional Textbook:

Preston, J., & Johnson, J. (2007). *Clinical psychopharmacology made ridiculously simple* (5th ed.). Miami: MedMaster.

Course Description (adapted from USU General Catalog 2007-2009 course descriptions): This course will examine both normal and abnormal behavior from a neuroanatomical and neurophysiological perspective. Additionally, pharmacological as well as nonpharmacological applications will be discussed where appropriate.

Course Objectives: The primary goal of this course is to provide a basic working knowledge of how the nervous system is organized, functions and how this relates to behavior. The approach will be a hierarchical one beginning with an examination of how the basic units of the nervous system, neurons, function and communicate with one another. Building on this foundation in neurophysiology, the organization of neural circuits, sensory and motor systems, basic survival behaviors, and finally, complex behaviors such as learning and memory, emotion, language, and psychological disorders will be explored. While many of these topics could easily fill an entire course of their own, the student should gain a sufficient understanding of how biology and behavior interact from this course to more fully appreciate that when we study behavior, we are *always* dealing with a biological organism and that behavior does not occur in isolation of this important fact.

Course Requirements: Each student will take 3 exams, a final exam, and write 3 short reviews of current research articles in behavioral neuroscience. Regular attendance is highly advised as this course relies heavily on material presented in lecture.

All exams will be given in-class and will consist of multiple choice, true/false, short answer and brief essay questions. The final exam will cover material presented after Exam 3 (~2/3 of the questions) **and** material from the first 3 exams (~1/3 of the questions). **The final exam is on Tuesday, April 29, 2008 from 1:30 – 3:20 PM.**

The 3 short reviews will be 2 – 3 pages, double-spaced, 1” margins, Arial, 12 pt. font. A copy of the original research article must be attached to receive credit for the assignment. Do **not** use review articles for this assignment. The articles you chose for these 3 papers should be no more than 5 years old (i.e. publication date of 2003 or more recent) and selected from appropriate journals. If you are not sure what journals to use for these assignments, please ask. Also, feel free to talk to me about whether a specific article will fulfill this requirement. The short review papers should contain a description of the question(s) the authors were investigating, what techniques they used, and a summary of their findings. In addition, provide a critical evaluation of the paper. Describe any flaws in the research, alternative approaches that could have been used, and what applications this research could have. Be clear and concise in your writing, quality is more important than quantity.

Grading:

Exam 1: 100 pts	<u>Letter Grade Scale:</u>
Exam 2: 100 pts	93 – 100% = A
Exam 3: 100 pts	90 – 92% = A-
Final Exam: 200 pts	87 – 89% = B+
Short Reviews: 50 pts each	84 – 86% = B
-----	80 – 83% = B-
Total points possible: 650 pts	77 – 79% = C+
	74 – 76% = C

Academic Dishonesty: Cheating and/or plagiarism will not be tolerated and will result in failing the specific exam/assignment and possibly the course. Please refer to the The Code of Policies and Procedures for Students at Utah State University for a detailed description of rights and responsibilities concerning these matters: <http://www.usu.edu/student-services/pdf/StudentCode.pdf>

ADA Compliance Statement: Reasonable accommodation will be provided for all persons with disabilities to ensure equal participation in the course. Please contact me early in the semester to make any necessary arrangements. Additionally, advice and services are available on campus through the Disability Resource Center (797-2444).

Additional Readings: The following references provide more in-depth information on the topics we will cover in this course and you may wish to refer to some of them for alternative explanations or illustrations.

Albers, R.W., Brady, S.T., & Price, D.L. (2006). *Basic neurochemistry: Molecular, cellular and medical aspects* (7th ed.). San Diego: Academic Press.

Julien, R.M. (2008). *A primer of drug action* (11th ed.). New York: Worth.

Kandel, E.R., Schwartz, J.H., & Jessell, T.M. (2000). *Principles of neural science* (4th ed.). New York: McGraw-Hill.

Nicholls, J.G., Martin, A.R., Wallace, B.G., & Fuchs, P.A. (2001). *From neuron to brain* (4th ed.). Massachusetts: Sinauer Assoc., Inc.

Squire, L.R., Bloom, F.E., McConnell, S.K., Roberts, J.L., Spitzer, N.C., & Zigmond, M.J. (2003). *Fundamental neuroscience* (2nd ed.). San Diego: Academic Press.

LECTURE TOPICS
(subject to revision as required)

Date	Topic	Readings	Assignments Due
INTRODUCTION TO THE NERVOUS SYSTEM			
8-Jan-08	Course introduction	Carlson Ch. 1	
10-Jan-08	Cells of the nervous system and neural communication	Carlson Ch. 2; Pinel & Edwards Ch. 3	
15-Jan-08	Organization of the nervous system	Carlson Ch. 3; Pinel & Edwards Ch. 2, 4 & 5	
17-Jan-08	Organization of the nervous system (cont.)	Carlson Ch. 3; Pinel & Edwards Ch. 1, 6 & 7	
22-Jan-08	Psychopharmacology	Carlson Ch. 4	
24-Jan-08	Research methods in neuroscience	Carlson Ch. 5	
29-Jan-08	EXAM 1		
SENSORY AND MOTOR SYSTEMS			
31-Jan-08	Vision	Carlson Ch. 6; Pinel & Edwards Ch. 8.1 & 8.2	
5-Feb-08	Auditory and vestibular systems	Carlson Ch. 7 (p. 211 - 234); Pinel & Edwards Ch. 8.3 & 8.4	
7-Feb-08	Somatosensory system	Carlson Ch. 7 (p. 234 - 245); Pinel & Edwards Ch. 8.5 - 8.7	

12-Feb-08 Chemoreception: Olfaction Carlson Ch. 7 (p. 251 - 256); Articles: Leon & Johnson (2006); Rinaldi (2007) **1st Short Review Paper Due**

14-Feb-08 Chemoreception: Gustation Carlson Ch. 7 (p. 246 - 251); Articles: Gilbertson & Boughter (2003); Scott (2004)

19-Feb-08 **No Class** -- Monday
Schedule due to holiday

21-Feb-08 Motor systems: Muscles and reflexes Carlson Ch. 8 (p. 259 - 268); Pinel & Edwards Ch. 9

26-Feb-08 Motor systems: Control of movement Carlson Ch. 8 (p. 269 - 289); Pinel & Edwards Ch. 7.8 & 9

28-Feb-08 EXAM 2

PHYSIOLOGY OF BEHAVIOR

4-Mar-08 Ingestive behavior Carlson Ch. 12 (p. 395 - 403); Pinel & Edwards Ch. 11.2

6-Mar-08 Ingestive behavior (cont.) Carlson Ch. 12 (p. 404 - 428); Pinel & Edwards Ch. 11.1

11 & 13-Mar-08 Spring Break

18-Mar-08 Sleep Carlson Ch. 9; Pinel & Edwards Ch. 11.5 & 11.6 **2nd Short Review Paper Due**

20-Mar-08 Sexual development Carlson Ch. 10 (p. 328 - 336)

25-Mar-08	Reproductive behavior	Carlson Ch. 10 (p. 336 - 361); Pinel & Edwards Ch. 11.7
27-Mar-08	Emotion and affective disorders	Carlson ch. 11 & 16; Pinel & Edwards Ch. 11.3 & 11.4

1-Apr-08

EXAM 3

HIGHER ORDER BEHAVIORAL PROCESSES

3-Apr-08	Learning and memory	Carlson Ch. 13 (p. 430 - 452)
8-Apr-08	Learning and memory (cont.)	Carlson Ch. 13 (p. 453 - 479); Pinel & Edwards Ch. 10
10-Apr-08	Language	Carlson Ch. 14; Pinel & Edwards Ch. 12.1 - 12.3
15-Apr-08	Neurological disorders	Carlson Ch. 15; Pinel & Edwards Ch. 9.6, 12.4 & 12.5
17-Apr-08	Psychiatric disorders	Carlson Ch. 17 (p. 586 - 593; 601 - 611)
22-Apr-08	Psychiatric disorders (cont.)	Carlson Ch. 17 (p. 594 - 601)
24-Apr-08	Addiction and drug abuse	Carlson Ch. 18

**29-Apr-08
(Tuesday)**

FINAL EXAM (1:30 - 3:20 PM)

**3rd Short Review
Paper Due**