

Research in Behavioral Neuroscience

PSY 348 – Spring 2007

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Contact Information

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Books

- **For reference purposes:** Bear, M. F., Connors, B. W., & Paradiso, M. A. (2007). *Neuroscience: Exploring the Brain* (3rd ed.). Baltimore: Lippincott, Williams & Wilkins. (Or any other comprehensive textbook on physiological psychology or behavioral neuroscience)
- **Recommended:** American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, D.C.: Author.
- **Optional:** Diamond, M. C., Scheibel, A. B., & Elson, L. M. (1985). *The human brain coloring book*. New York: Barnes & Noble.

Overview

This course will examine the methods used in understanding the role of the nervous system in behavior. We will begin with those methods that provided a basic knowledge of the function of the nervous system, and proceed through a discussion of studies that illuminated our understanding of behavioral and mental phenomena. The course is organized around the laboratory. In the lab we will undertake projects that will enhance your understanding of methods used in behavioral neuroscience research; in lecture we will discuss material directly related to the lab projects. By the end of the semester you will know about methods used by behavioral neuroscientists in sufficient detail that you will be able to understand the literature and know what sort of method could be employed to answer a particular question.

I will assume that you have a basic understanding of the function of neurons (such as might have been gained in NEUR/PSY 241) and of basic psychological principles related to sensation (e.g., Weber's law), learning (e.g., Thorndike's law of effect), memory (e.g., retrograde and anterograde amnesia), motivation (e.g., effect

of satiety on performance), and consciousness (e.g., different types of sleep). As they become relevant, these and other topics will be reviewed and amplified over the course of the semester.

In the laboratory we will start by examining the anatomy of the brain via the dissection of sheep brains. After this we will conduct a demonstration of electrophysiological recording in the human. We will conclude the semester by conducting a major experiment designed by one (or more) of you. It is possible (if the study is well done) that this work will be presented next fall at the annual meeting of the Society for Neuroscience in San Diego, CA.

Topics & Reading List

We will read papers (some classic, some new) related to the topics that we discuss. Some names below correspond to papers listed in the References; these papers are available online or on reserve in the library. Remaining papers will become available later in the semester. Reading list might change as the semester progresses.

Topic	Reading	Week
Neurons	Krnjevic	1
Neurons	Hawkins et al.	2
Learning	Hawkins et al.	3
Learning	Shors	4
		Exam 1
Perception	Hubel & Wiesel	5
Perception	Quiroga et al.	6
Movement	Cheng	7
Movement	**	8
		Exam 2
Motivation	**	9
Motivation	LeVay	9
Emotion	Kluver & Bucy	10
Emotion	Fendt et. al.	11
		Exam 3
Psychopathology	**	13
Psychopathology	Rapoport	14
(Consciousness)	**	15)
		Exam 4

** to be determined

Grading

Exams

There will be four exams, consisting for the most part of short-answer essay questions. Each exam will cover explicitly the material presented in class and in the readings since the previous exam. There is no cumulative final exam; however, you should not assume simply because you have been tested on something that it is no longer important. An understanding of material presented later in the semester will require a knowledge of material presented earlier.

Term Paper

A term paper is required in this course. It should be about 8 pages long (excluding title page, abstract and references) and must address a topic relating the nervous system and behavior. More information about the paper will be forthcoming. The paper must be written according to APA style. The due date for the paper appears below; your paper **MUST** be turned in by noon on the specified day. Late papers will be penalized at a rate of 10% of their potential value per day.

Course Grade

Your grade will be based on a weighted average of your grades on the exams, the paper, and your lab grade. The exams will count for 55% of your grade (lowest test score: 10%; others 15%), the paper 10%, and the lab 35%.

The graded assignments for the lab portion of the course are specified on the Laboratory Syllabus. In general, they will involve an exam covering neuroanatomy, a proposal for a research project, and participation in and your report on a final project.

Then your grade for the course will be determined as follows:

90 - 100: 4.0	70 - 72.9: 2.0
87 - 89.9: 3.7	67 - 69.9: 1.7
83 - 86.9: 3.3	63 - 66.9: 1.3
80 - 82.9: 3.0	60 - 62.9: 1.0
77 - 79.9: 2.7	< 60: 0
73 - 76.9: 2.3	

Attendance

Attendance and participation in class is expected. If you miss one exam, for a sufficiently serious reason, and inform me of this within 24 hours of the exam, you may take a make-up test. If you miss more than one exam, you will receive a grade of ZERO for each additional missed exam.

Attendance and participation in labs is required (there is no easy way to make up missed labs). Later in the

semester our lab schedule might become very flexible, with labs scheduled at times other than the assigned lab meeting periods. Depending on the major research project(s) that we undertake you might spend more than 2 hr/week in lab (good research requires time). Earlier in the semester you might find that you are spending less than the nominal 2 hr/week in lab.

Paper Due Dates

Your proposed term paper topic is due on Friday, February 16. Note: you must provide me with at least two references that you expect to cite in the term paper.

The term paper is due by noon on **Wednesday, April 11**.

I will review printed drafts of the paper if I receive them by Friday, April 6.

Note that there will also be written work in the lab portion of the course. Most notably, you will be turning in the proposal for a research project around March 1, and the final write-up about that project at the end of the semester. Keep this in mind as you allocate time to work on the term paper.

A Final Note

If you find that you need assistance with the material presented in this course, or if you just want to talk about it, please see me. My office hours are listed above, but if you cannot meet with me at those times please make an appointment with me. I am on campus nearly every day, including weekends, and will find time to meet with you.