



Course Syllabus
PSY 410 – Introduction to Behavioral Neuroscience
College of Liberal Arts and Sciences
Winter 2012

Course

Course Number: PSY 410, Section 009, CRN 44591
Course Name: Selected Topics: Introduction to Behavioral Neuroscience
Course Location: Neuberger Hall 59 (verify)
Class Times: MW, 4:40 pm – 6:30 pm; begins January 9, 2012
Prerequisites: Introduction to Psychology

Instructor

Instructor: Dennis Swiercinsky, PhD, Adjunct Professor
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Office Hours: Arranged by appointment, noon – 1 pm, CH 366

Course Description/Overview

This course provides an introduction to behavioral neuroscience, especially focusing on neuroanatomy and neuron physiology relevant to psychological functioning. Essential neurochemical and neurophysiological systems are examined that underlie virtually all sensory, motor, behavioral, cognitive, and psychological processes. Brain anatomy is studied from a developmental and functional perspective. Knowledge acquired in this course is relevant to normal human functioning, mental health and illness, psychopharmacology, and related areas.

Learning Objectives

Objectives for this course include:

1. Appreciate the time and space scales necessary to grasp key concepts in neural structures and functions that account for complex psychological behaviors.
2. Understand the unique structure and function of neural cells, how they aggregate, how they communicate, and how they provide the foundation for representation of memory.
3. Understand essential features of neurochemical and hormonal communication systems, and cell assemblies, as these relate to behavioral and psychological processes.
4. Describe the essential pharmacodynamics of various classes of drugs that influence behavior and their relationships to neurotransmitter and receptor systems.
5. Identify the structural and functional relationships of major brain anatomical features.

6. Describe common methodologies used in neuroscience research.
7. Describe the state of knowledge that supports nature via nurture principles, including the foundation of the human genome, genetic processes, neuroevolution, neurodevelopment, and experience-dependent neuromaturation.
8. Demonstrate essential neural mechanisms underlying sensory systems and perceptual processes.
9. Understand essential neuroeffector systems and how they interact to move muscles and produce a wide range of behaviors.
10. Understand the essential neurodynamics of learning, memory, forgetting, intelligence, language, and general cognition.
11. Appreciate general neurofunctional abnormalities that underlie major behavioral dysfunctions (i.e., psychological disorders).

Instructional Philosophy

Lectures and classroom activities complement the subject at hand. Demonstrations, model-building, lecture/discussions, critical thinking exercises, and multimedia presentations are among the teaching/learning strategies employed. *Classroom content does not usually duplicate textbook content. The two resources for learning about behavioral neuroscience complement each other. Students are examined over the assigned textbook reading, assignments, and lecture materials.*

“Success” in this course means the student becomes enmeshed in all learning strategies. This involves completion of timely readings, participating in classroom activities, demonstrating the acquisition of core concepts and ideas on quizzes, and completing assignments. *This course is not appropriate for students who believe that class attendance is optional or unimportant.*

The instructor is the student’s resource for:

- Identifying processes and concepts relevant to studying neuroscience;
- Assisting in accessing and interpreting key neuroscientific information;
- Assisting in identifying and integrating interdisciplinary knowledge and relating it, specifically, to psychologically-relevant neuroscience;
- Assisting in applying neuroscientific knowledge to practical personal, health, educational, and social problems;
- Encouraging each student’s integration of interdisciplinary biopsychosocial knowledge with personal academic and career goals; and
- Evaluating depth and quality of student knowledge acquisition.

Resources

Class Meetings

The instructor provides lecture presentations, moderates class discussions, and serves as a resource for helping students achieve course objectives and cultivate important and creative thinking about psychological studies. Attendance at class meetings is crucial. *Please arrive at class on time to avoid distractions.*

Required Textbook

Garrett, B. (2011). *Brain & Behavior: An Introduction to Biological Psychology, 3rd Edition*. Los Angeles: Sage Publishers.

Recommended (Not Required) Supplements

Woolsey, TA, Hanaway, J, Gado, MH. (2008). *The Brain Atlas: A Visual Guide to the Human Central Nervous System, Third Ed.*, Hoboken, NJ: Wiley & Sons.

Hendelman, WJ. (2006). *Atlas of Functional Neuroanatomy, Second Ed.*, Boca Raton: Taylor & Francis.

Course Supplies Required

In addition to the textbook, students must have a drawing pad (minimum size is 9x12), pencils (*colored pencils preferred*, 4 colors minimum).

Course Website

Desire 2 Learn <http://d2l.pdx.edu>

Textbook Website <http://www.sagepub.com/garrett3e/study/default.htm>

Additional Web site Resources

Allen Human Brain Atlas <http://www.brain-map.org> (Highly recommended)

Journals, and other resources/essays in neuroscience <http://www.brainsource.com>

Sylvius neuroanatomy <http://www.sylvius.com/>

Scientific measurement <http://lamar.colostate.edu/~hillger/common.html>

Greek alphabet <http://www.physlink.com/Reference/GreekAlphabet.cfm>

Neuroanatomy <http://www9.biostr.washington.edu>

Neuroanatomy <http://www-medlib.med.utah.edu/WebPath/HISTHTML/NEURANAT/NEURANCA.html>

Neuroanatomy <http://imagemanager.biostr.washington.edu>

Neuroscience tutorial <http://thalamus.wustl.edu/course/>

Atlas of brain images <http://www.msu.edu/~brains/>

Brodmann's brain areas <http://spot.colorado.edu/~dubin/talks/brodmann/brodmann.html>

Protein animations <http://www.moleculesinmotion.com/>

Medical biochemistry <http://web.indstate.edu/thcme/mwking/amino-acids.html>

Amino acids <http://www.johnkyrk.com/aminoacid.html>

Animation of illicit drugs <http://learn.genetics.utah.edu/units/addiction/drugs/mouse.cfm>

Genetics <http://learn.genetics.utah.edu/>

Brain resources <http://www.dana.org/default.aspx>

Grading

Grade Basis

Grades will be based on points earnable for lecture attendance, assignments, quizzes, and final examination as indicated in the table at the end of the syllabus. A total of 260 points may be earned in the course. (Up to 28 "extra points" earned on the final exam may substitute for missed points on attendance, assignments, or quizzes.) Final letter grades are assigned according to University standards based on total percentage.

| Letter | Percentage | Grade points | Rating |
|---------------|-------------------|---------------------|---------------|
| A | 93% & above | 4.00 | Excellent |
| A- | 90% - 92% | 3.67 | |
| B+ | 88% - 89% | 3.33 | |
| B | 83% - 87% | 3.00 | Good |
| B- | 80% - 82% | 2.67 | |

| | | | |
|-----------|--|------|--------------|
| C+ | 78% - 79% | 2.33 | |
| C | 73% - 77% | 2.00 | Satisfactory |
| C- | 70% - 72% | 1.67 | |
| D+ | 68% - 69% | 1.33 | |
| D | 63% - 67% | 1.00 | Inferior |
| D- | 60% - 62% | 0.67 | |
| F | 59% and below | 0.00 | Failure |
| I | Incomplete; given only when a student is unable to complete a minor segment of the course because of circumstances beyond the student's control. A grade of incomplete may be given only when approved in advance of the final exam. | | |
| X | A grade of X is issued when the instructor finds no basis for a grade, such as non-attendance. X grades carry no credit and are not included when calculating G.P.A. | | |

Lecture Attendance (38 points possible; approximately 15% of final grade)

Because considerable additional or elaborated information is presented in lectures, students earn 2 points for attending and participating in each daily lecture. *It is each student's responsibility to sign the attendance for each class period. Students who arrive late or leave early will not receive lecture credit for that class session.*

Assignments (100 points maximum possible; approximately 38% of final grade)

Assignments, ten at 10 points each, are a key component of this course. Assignments are intended to provide opportunity for the student to become fully involved with the course content, and produce drawings that cement key information and concepts. Fulfilling the assignments will require the student to go beyond the textbook and seek additional resources. Grading of assignments is based on accuracy as well as care the student reflects in completing the assignment (e.g., neatness, precision, clarity). Instructions for each assignment are posted on D2L.

Quizzes (100 points maximum; approximately 38% of final grade)

Ten short quizzes (each worth 10 points) will be administered in class throughout the term. Quiz items will represent a range of difficulty levels. Quizzes will be administered at the beginning of class sessions and will generally cover material presented in the previous one or two class sessions.

Final Examination (22 points maximum; 28 points extra credit; approximately 12% of final grade)

One final comprehensive examination is administered during finals week. A student may earn up to 28 "extra" points from the final examination to make up for deficiencies in lecture attendance, quizzes, or assignments. *However, counting on these "extra" points is not advised as the final comprehensive examination will be difficult and will cover a broad spectrum of course content.*

Late Work

Late assignments and quizzes are not accepted. If a student misses any part of a lecture attendance, quiz, or assignment, points may be made up only on the "extra points" portion of the final.

Policies

Accommodating Students with Disabilities: Students who have a disability and require a classroom adjustment or accommodation should make their needs known and should meet with the instructor at the beginning of the term to discuss individual needs.

Academic Integrity: Academic integrity is essential. Plagiarism, cheating, or the deliberate misrepresentation of information will result in a failing grade in this course. Students are expected to

maintain a high standard of personal ethics. Evidence of cheating, helping others to cheat, or plagiarism will have serious academic consequences and referral to the Scholastic Standards Committee. Respect for classmates is essential during class participation.

Classroom Policy: No audio or video recording by a student during class is allowed, except explicitly for personal use. Cell phones, iPods, PDAs, or any other similar electronic devices must be turned off and stowed while in the classroom unless they are explicitly and only being used for recording notes. Students using laptop computers during class must demonstrate that their use during class is clearly relevant to the ongoing class activity and must not present any sounds or other distractions. Food, candy, and drinks (except for water) should not be brought to class as they are often distracting to others.

Schedule of Lectures, Quizzes, and Assignments

The following schedule of lectures, quizzes, and assignments reflects the course coverage. Any changes in dates for events will be announced well in advance on D2L.

| Date | Lecture | Garrett Text Chaps. | Quiz * | Assn. Due | Points Daily/Cumul. | Your Points Earned |
|--------|---|---------------------|--------|-----------|---------------------|--------------------|
| M 1/9 | Living in Space, Time, and Dynamics | 1 (p. 2-8) | | | 2/2 | |
| W 1/11 | Neurons and Glia | 2 | | | 2/4 | |
| M 1/16 | Holiday | | | | | |
| W 1/18 | (Continued) | | | 1 | 12/16 | |
| M 1/23 | Nuclear Data Vault: Genome | 1 (p. 9-16) | 1 | 2 | 22/38 | |
| W 1/25 | Cell Systems & Connectome | 3 | | 3 | 12/50 | |
| M 1/30 | (continued) | | 2 | | 12/62 | |
| W 2/1 | Cell Development | 3 | 3 | 4 | 22/84 | |
| M 2/6 | Cell Physiology & Proteome | 2, 5 | 4 | 5 | 22/106 | |
| W 2/8 | (continued) | | | | 2/108 | |
| M 2/13 | Methodology in Neuroscience | 4 | 5 | | 12/120 | |
| W 2/15 | Hearing and Language | 9 | | 6 | 12/132 | |
| M 2/20 | Vision and Imagery | 10 | 6 | 7 | 22/154 | |
| W 2/22 | (continued) | | | | 2/156 | |
| M 2/27 | Somatosensory-Motor System | 11 | 7 | 8 | 22/178 | |
| W 2/29 | (continued) | | | | 2/180 | |
| M 3/5 | Learning and Memory | 12 | 8 | 9 | 22/202 | |
| W 3/7 | (continued) | | | 10 | 12/214 | |
| M 3/12 | Neurocognition | 13 | 9 | | 12/226 | |
| W 3/14 | Complex Dynamical Systems | | 10 | | 12/238 | |
| M 3/19 | FINAL EXAM (5:30 pm) | | | | 22/260 | |
| | Extra Points Maximum possible to earn beyond the 22 required. | | | | (28)/260 | |
| | FINAL POINTS | | | | | |

*Quizzes are administered at the beginning of class. Each quiz covers material from the prior class sessions and assigned reading back to (and including) the class date of the previous quiz.