

PSYCHOLOGY 215: BRAIN MATTERS

Fall 2010

Tuesdays/Thursdays, 9:30 – 10:50 am

300 Pettigrew Hall

Instructor: Nancy Koven, Ph.D.
Email: nkoven@bates.edu
Office: 365 Pettengill Hall
Office Hours: Mondays 2:00 – 4:00 pm

Course Description

This course explores how regulation and dysregulation of mind results from differential brain activity. Following an introduction to the structure and function of the human central nervous system, we consider examples of neurological and psychiatric pathology and discuss psychological and neuroscientific approaches to intervention. Topics include neuronal signaling, neuroanatomy, neuroplasticity, psychopharmacology, states of consciousness, categories of mental illness, models of psychotherapy, and human/machine interactions.

Texts

The texts listed below are required for this course and are available at the campus bookstore or from vendors online. Other readings assigned as the semester progresses will be made available on Lyceum. You are expected to read the assigned material *before* the day on which it is listed in the course calendar. As you read, think about the issues that are raised and formulate any questions that come up for you. This will help you gain more from the lectures.

- Taylor, J. B. (2009). *My stroke of insight: A brain scientist's personal journey*
- Ramachandran, V. S., & Blakeslee, S. (1999). *Phantoms in the brain: Probing the mysteries of the human mind*
- Millon, T. (2004). *Masters of the mind: Exploring the story of mental illness from ancient times to the new millennium*

Special Considerations: Students with Disabilities

If you have a condition or disability that causes difficulty with learning in the classroom, completing assignments as described, or taking examinations, please see me as soon as possible. Documentation from the Office of the Dean of Students is needed before accommodations can be made. I cannot make accommodations on short notice.

Classroom Environment

It is essential that our classroom be a place where people feel comfortable expressing their thoughts, feelings, and opinions, without fear of unduly critical or judgmental responses, especially during classroom discussions. I expect all students to be respectful of the widely varied experiences and backgrounds represented by the classroom members as a group. Disrespect or discrimination on any basis will not be tolerated.

Academic Honesty

Cheating on exams will not be tolerated. If anyone is caught cheating, I will take the appropriate action. Any semblance of cheating will result in a formal accusation of cheating, so please avoid all behaviors that might be considered, by a reasonable judge, as cheating. If you are having problems in class that you feel at risk of cheating, please make arrangements to see me during office hours or by appointment. Plagiarism involves the representation of someone else's work as your own and is as serious an offense as cheating. Please familiarize yourself with the College's policy on academic dishonesty at: <http://abacus.bates.edu/pubs/Plagiarism/plagiarism.html#0>. Plagiarism and/or cheating will result in an automatic failure for the project/exam.

GRADING COMPONENTS

Exams

There will be 3 in-class exams throughout the semester, each worth 120 points. The second and third exams will not be cumulative. The third exam is scheduled during the final exam week at a date/time set by the Registrar's Office.

Oral Presentation

There are three days during the semester in which students will give oral presentations in small teams: October 12th, November 2nd, and December 7th. Presentations are expected to last approximately 12 minutes, with a few minutes at the end of the presentation to answer questions from classmates. Presentations are expected to be in PowerPoint format such that slides may be loaded onto the course's Lyceum page for future reference. Students will work in groups to share the responsibilities of the presentation.

Choices of presentation topics for October 12th include: multiple sclerosis, brain tumor, epilepsy, Korsakoff's syndrome, and traumatic brain injury. Choices of topics for November 2nd include: phantom limb, anosognosia, pseudocyesis, Charles Bonnet syndrome, and Capgras syndrome. Finally, choices of topics for December 7th include: electroconvulsive shock therapy, meditation, biofeedback, antioxidant diets, and transcranial magnetic stimulation.

Research Participation

Participation in research is a valuable way to get firsthand exposure to the variety of research conducted within the Psychology and Neuroscience programs. There will be a number of student and faculty research projects recruiting participants this semester. You are expected to be involved in the equivalent of 2 units worth of participation or do an alternative writing assignment. You only get credit for participating in approved experiments. All eligible experiments are assigned a number and listed on this webpage:

<http://abacus.bates.edu/acad/depts/psychology/studentresearch.html>

Each experiment has a fixed number of units assigned to it based on the average length of time that it will take to participate. Typically, 1 hour worth of participation is equal to 1 unit, with each quarter hour represented by 0.25 units. Be sure to check the number of units when you sign up for the experiment. To sign up for an experiment, see instructions on the bulletin board in the Psychology Department (3rd floor Pettengill Hall). When you sign up for an experiment, you are making an appointment for which you must show up. If you do not show up or cancel with

sufficient notice, you will be penalized 5 class points regardless of the credit value of the experiment. Upon completion of the experiment, you will receive a paper receipt of your participation listing the experiment number and the amount of credit you have earned. Save this receipt! Although it is the experimenter's responsibility to report your participation to the department, this receipt is the only proof that you have of your participation. You may need it to resolve discrepancies if they arise. Please note that, for online studies in which your participation is entirely Internet-based, you will be prompted to provide your name and my name upon completion of the online study. This information will be recorded separately from your responses (to maintain the confidentiality of your data) and given to me at the end of the semester so that I can verify your participation.

If you decide to opt for a writing assignment in lieu of research participation, you must notify me of this decision by 10/29/10 so that you receive instruction on the writing assignment in a timely manner. If you do not complete either of these options, you will lose 20 points (4%) off of your final grade.

Writing Assignment

There is a formal writing assignment for this course that is due on the last day of class, 12/9/10 at the beginning of class. In this assignment, you are asked to write a 5-6 page analysis of Taylor's (2009) book 'My Stroke of Insight' as it relates to the question of what in the brain constitutes "the self". More information about this writing assignment will be provided during the semester.

There is a maximum of 500 points for this course:

Exams	3 x 120 pts = 360 pts	→ 72% of total grade
Oral Presentation	1 x 50 pts = 50 pts	→ 10% of total grade
Research Participation	2 hrs = 20 points	→ 4% of total grade
Writing Assignment	1 x 70 pts = 70 pts	→ 14% of total grade

The final letter grade will be based on the number of points you have earned divided by the total points possible for the course.

# of points	% of 500	Grade
465-500	93-100	A
450-464	90-92.99	A-
435-449	87-89.99	B+
415-434	83-86.99	B
400-414	80-82.99	B-
385-399	77-79.99	C+
365-384	73-76.99	C
350-364	70-72.99	C-
335-349	67-69.99	D+
315-334	63-66.99	D
300-314	60-62.99	D-
< 300	< 60	F

Course Calendar

Date	Topic	Readings
9/9	Mind vs. brain	LeDoux (2002) pgs. 13-32; Millon (2004) prologue pgs. xi-xii
9/14	Neurons and glia	Kalat (2009) chapter 2 pgs. 27-36
9/16	The action potential	Kalat (2009) chapter 2 pgs. 37-46
9/21	Synapses	Kalat (2007) chapter 3 pgs. 52-57
9/23	Neurotransmitters	Freberg (2006) chapter 4 pgs. 90-103
9/28	Neuroanatomy	Baars & Gage (2007) chapter 5 pgs. 121-132
9/30	Neuroanatomy (cont.)	Baars & Gage (2007) chapter 5 pgs. 132-146
10/5	EXAM #1	
10/7	Brain assessment methods	Banich (2004) chapter 3, pgs. 62-96
10/12*	Brain diseases and injuries	Holtz (2011) chapters 3 & 4, pgs. 82-84, 89-91, 92-94, 102-110 [topics consistent with in-class presentations]
10/14	Neural plasticity	Kolb & Wishaw (2009) chapter 25, pgs. 718-735
10/19	Post-stroke emotional changes	Holtz (2011) chapter 3, pgs. 84-86 Ramachandran & Blakeslee (1999) pgs. 199-211
10/21	NO CLASS: FALL RECESS	
10/26	Altered states of consciousness	Laureys et al. (2004) pgs. 537-546
10/28	Unusual brain phenomena	Ramachandran & Blakeslee (1999) pgs. 21-38, 85-112
11/2*	Unusual brain phenomena	Ramachandran & Blakeslee (1999) pgs. 127-157, 158-173, 212-226
11/4	Neuropsychiatric diagnosis and law	Morse (2007) pgs. 195-205
11/9	EXAM #2	
11/11	History of brain science	Millon (2004) chapter 6 pgs. 200-243
11/16	NO CLASS: AWAY AT CONFERENCE	
11/18	Effects of psychotherapy on brain	Etkin et al. (2005) pgs. 145-158
11/23	NO CLASS: THANKSGIVING BREAK	
11/25	NO CLASS: THANKSGIVING BREAK	
11/30	Drug interventions	Freberg (2006) chapter 4 pgs. 104-118
12/2	Surgical and mechanical interventions	Clausen (2009) pgs. 1080-1081
12/7*	Other intervention strategies	-----
12/9†	Finding and defining the perfect brain	Cheung (2009) pgs. 391-401
12/15	EXAM #3 (10:30 am - 12:30 pm)	

* In-class student presentations

† Writing assignment is due at the beginning of the class period

The full reference for each of the readings listed above is as follows:

- Baars, B. J., & Gage, N. M. (2007). *Cognition, brain, and consciousness*. Burlington, MA: Elsevier Academic Press.
- Banich, M. T. (2004). *Cognitive neuroscience and neuropsychology, 2nd edition*. Boston, MA: Houghton Mifflin.
- Cheung, E. H. (2009). A new ethics of psychiatry: Neuroethics, neuroscience, and technology. *Journal of Psychiatric Practice, 15*, 391-401.
- Clausen, J. (2009). Man, machine, and in between. *Nature, 457*, 1080-1081.
- Etkin, A., Pittenger, C., Polan, H. J., & Kandel, E. R. (2005). Toward a neurobiology of psychotherapy: Basic science and clinical applications. *The Journal of Neuropsychiatry and Clinical Neurosciences, 17*, 145-158.
- Freberg, L. A. (2006). *Discovering biological psychology*. Boston, MA: Houghton Mifflin.
- Holtz, J. L. (2011). *Applied clinical neuropsychology*. New York, NY: Springer.
- Kalat, J. W. (2007). *Biological psychology, 9th edition*. Belmont, CA: Wadsworth Press.
- Kalat, J. W. (2009). *Biological psychology, 10th edition*. Belmont, CA: Wadsworth Press.
- Kolb, B. & Wishaw, I. Q. (2009). *Fundamentals of human neuropsychology, 6th edition*. New York, NY: Worth Press.
- Laureys, S., Owen, A. M., & Schiff, N. D. (2004). Brain function in coma, vegetative state, and related disorders. *Lancet Neurology, 3*, 537-546.
- LeDoux, J. (2002). *The synaptic self: How our brains become who we are*. New York, NY: Penguin Group.
- Morse, S. J. (2007). New neuroscience, old problems: Legal implications of brain science. In Glannon, W. (Ed.) *Defining right and wrong in brain science*. New York, NY: Dana Press, 195-205.