

Doctoral Program in Clinical Psychology
The Graduate Center of the City University of New York

Biological Bases of Behavior
Course # 75102.16178
Fall, 2010

Professor: Eric A. Fertuck, Ph.D.

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Day & Time: Tuesday: 9:45-11:40am, NAC Room 8/132

Office Hours: By appointment

Course Description:

This course aims to provide an exposition of research and theory in the biological bases of normal and abnormal behavior. A survey of literature will span from nerve cells, the organization and functioning of the nervous system, to the neurobiological systems that underlie sensation, motor behavior, emotion, cognition, and self-other representation, and social behavior. We will also integrate understanding of altered behavioral processes of brain-damaged and psychiatric patients with knowledge of basic neuronal and neurobiological processes.

Each week, students will be required to read a chapters, case studies, and articles dealing with a specific topic in the biological basis of behavior. Participation will be encouraged through the formal generation of weekly discussion points based on the readings and the assignment of student presentations linking neurobiological processes to clinical phenomena.

Since much of academic life consists of presenting your findings at conferences, the class will include mini-conference sessions consisting of powerpoint presentations of your independent review of how a basic neurobiological processes that you are studying can inform understanding of a clinical phenomenon in clinical psychology. Based on the critical feedback you receive, a review paper is due by the end of the semester.

Because of this reliance on group participation, it will be essential that students read papers and chapters before coming to class. This will enhance the discussion and learning experience for all.

Course Objectives:

This course is designed to:

- (1) Provide students with an overview of brain organization and functional neuroanatomy

- (2) Survey the biological processes that underlie sensation, perception, memory, emotion, affiliation, reproductive behavior, and psychopathology
- (3) Integrate basic biological processes with single case studies in neurology and clinical psychology
- (4) Integrate understanding of neurobiological processes into understanding normal and abnormal mental and behavioral functioning

Requirements and Grading:

Student Performance Evaluation:

A. Class Presentation (30% of Grade): 20 minute in-class presentation relating a neurobiological process to a clinical phenomenon or treatment. Starting in the 5th week of the class, 1-2 students per week will give a 20 minute presentations on a topic of their choice. The topic must be germane to the content of the class and should include a theme relevant to clinical psychology. Topics need to be approved by the instructor prior to preparing the presentation.

B. Paper (40% of Grade): A 1500-2500 word (not including references, tables, or figures) review based on your class presentation that incorporates the feedback you received during your presentation. APA style. Due Friday, Dec. 10.

C. Class Participation and Discussion Points (30% of Grade): To promote engagement with the readings and topics, weekly discussion points and questions are to be emailed to instructor before class and in class participation. By Monday morning the day before the Tuesday lecture, email the instructor one discussion point for every reading of that week. The instructor will review the discussion points and use them to guide the content of the class the following day.

Required Texts:

Sacks, O. (1985/1998). *The Man Who Mistook His Wife for a Hat*. New York: Touchstone.

Doidge, N. (2007). *The Brain that Changes Itself*. New York: Viking.

Carlson, N. R. (2010). *Physiology of Behavior (10th Edition)*. Pearson: Boston, MA.

Weekly Reading Assignments and Class Topics:

Week 1 (Sept. 7). Overview of the Relationship Between Mind, Brain, and Body.

1. Online Video. Charlie Rose Brain Series, "The Great Mysteries of the Human Brain." http://www.charlierose.com/view/interview/10694?sponsor_id=1
2. Chapter 9. *The Brain that Changes Itself*.
3. Introduction. *The Man Who Mistook His Wife for A Hat*.
4. Chapter 1. *Physiology of Behavior*.

Week 2 (Sept. 14). The Structure and Functions of Cells in the Nervous System.

1. Chapter 2. *Physiology of Behavior*. The Structure and Functions of Cells of the Nervous System.
2. Chapter 10. Doidge, N. *The Brain that Changes Itself*.

Week 3 (Sept. 21). The Structure of the Nervous System.

1. Chapter 1. Solms, M. (2002). *The Brain and the Inner World*. Other Press: New York.
2. Chapter 3. *Physiology of Behavior*. The Structure of the Nervous System.

Week 4 (Sept. 28). Psychopharmacology. (Guest Lecture:-Mallay Occhiogrosso, MD)

1. Film: *Awakenings* (1990). To be seen before class.
2. Chapter 4. *Physiology of Behavior*. Psychopharmacology.

Week 5 (Oct. 5) Sensation and The Visual System

1. Sacks, O. *The Man Who Mistook His Wife for A Hat*. Chapter 1. ("The Man Who Mistook His Wife for A Hat")
2. Online Video. Charlie Rose Brain Series, "The Perceiving Brain."
3. Chapter 6. *Physiology of Behavior*. Vision.

Week 6 (Oct. 12). Motor Behavior

1. Sacks, O. Chapter 3. *The Man Who Mistook His Wife for A Hat*. ("The Disembodied Lady")
2. Sacks, O. *The Man Who Mistook His Wife for A Hat*. Chapter 5. ("Hands")
3. Online Video. Charlie Rose Brain Series, "The Acting Brain."
4. Chapter 8. *Physiology of Behavior*. Control of Movement.

Student Presentations

Week 7 (Oct. 19). Memory and the Brain

1. Sacks, O. *The Man Who Mistook His Wife for A Hat*. Chapter 2. ("The Lost Mariner")
2. Film: *Memento* to be seen before class
3. Chapter 13. *Physiology of Behavior*. Learning and Memory.

4. Optional reading: Schacter, D. L., Wagner, A. D., & Buckner, R. L. (2000). Memory systems of 1999. In E. Tulving, & F. I. M. Craik (Eds.), *The Oxford handbook of memory* (pp. 627 – 643). New York: Oxford University Press.
5. Optional Video: Online Video. Charlie Rose Brain Series, “The Aging Brain.”

Student Presentations

Week 8 (Oct. 26). Biology of Stress and Arousal

1. Arnsten, A. F. (1998). The biology of being frazzled. *Science*, 280(5370), 1711-1712.
2. Doidge, N. *The Brain that Changes Itself*. Chapter 6.
3. Chapter 17. *Physiology of Behavior*. Anxiety Disorders, Autistic Disorders, ADHD, and Stress Disorders

Student Presentations

Week 9 (Nov. 2) Motivation/Reward and the Brain and Body

1. Damasio, A. *Descartes' Error*. Chapters 1 and 2. Phineas Gage.
2. Doidge, N. *The Brain that Changes Itself*. Chapter 11
3. Sacks, O. *The Man Who Mistook His Wife for A Hat*. Chapter 10. (“Witty Ticcy Ray”).
4. Online Video. Charlie Rose Brain Series, “The Emotional and Vulnerable Brain”

Student Presentations

Week 10 (Nov. 9) Functional Imaging and the Neural Circuitry of Attention and Decision Making (Guest Lecture: Jack Grinband, Ph.D.)

1. Online Video. Charlie Rose Brain Series, “The Deciding Brain”
2. Chapter 5. *Physiology of Behavior*. Methods and Strategies of Research
3. Grinband, J., et al. Conflict Monitoring versus Response Selection in the Medial Frontal Cortex.

Week 11 (Nov. 16) Language and Aphasia

1. Sacks, O. *The Man Who Mistook His Wife for A Hat*. Chapter 9 (“The President’s Speech”)
2. Doidge, N. *The Brain that Changes Itself*. Chapter 2
3. Chapter 14. *Physiology of Behavior*. Human Communication.

Student Presentations

Week 12 (Nov. 23) Emotion and the Brain (Guest Lecture: Margaret Zellner, Ph.D.)

1. Online Video. Charlie Rose Brain Series, “The Anxious Brain.”

2. Solms, M. *The Brain and the Inner World*. Chapter 4. Emotion and Motivation.
3. Ledoux, J. *The Emotional Brain*. Chapters 1, 3, and 4.
4. Recommended but optional. Chapter 11. *Physiology of Behavior*. Emotion.

Student Presentations

Week 13 (Nov. 30) Behavioral and Psychiatric Genetics (Guest Lecture: Scott Wilson, Ph.D.)

1. Nussbaum, R.L, McInnes, R. R., & Willard, H. F. (2004). Thompson & Thompson *Genetics In Medicine*. 6th edition. Philadelphia: Elsevier. Chapter 8: Genetics of Disorders with Complex Inheritance.

Week 14 (Dec. 7) The Social Brain: Sexuality, Affiliation, and Social Cognition

Readings:

1. Online Video. Charlie Rose Brain Series, “The Social Brain.”
2. Chapter 10. *Physiology of Behavior*. Reproductive Behavior.
3. Lieberman, M. D. (2007). Social Cognitive Neuroscience: A Review of Core Processes. *Annual Review of Psychology*, 58(1), 259-289.

Student Presentations

Week 15 (Dec. 14) Review and Synthesis

Readings:

1. Online Video. Charlie Rose Brain Series, “The Mentally Ill Brain.”
2. Doidge, N. *The Brain that Changes Itself*. Appendix 1 (“The Culturally Modified Brain”).
3. Kandel, E. Two articles from American Journal of Psychiatry.

Student Presentations
