



# Behavioral Neuroscience

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## :: Course Syllabus ::

**Textbook** - Bear, MF, Connors, BW, and Paradiso, MA. Neuroscience, Exploring the Brain, 3 ed. 2006, Lippincott Williams & Wilkins.

### Unit 1

- Read in textbook Chapters 1, 2, 3, and 4
- Lectures and comments Chapters 1, 2, 3, and 4
- Powerpoint file on Neurons
- Powerpoint file on Glia
- Lecture on "How and Why: The Nature of Explanation of Nature "
- Assignment, How and Why explanations (2 points, see lecture for details)
- Take quizzes until you can consistently score at a level that is satisfactory to you
- **Take Exam 1 (See calendar for due date)**

### Unit 2

- Read in textbook Chapters 5, 6, and 7
- Lectures and comments Chapters 5, 6, and 7
- Powerpoint file on Synapses
- Powerpoint files on Neuroanatomy (two parts)
  - Brett, M., Johnsrude, I.S., and Owen, A.M. (2002) The problem of functional localization in the human brain.
  - Russo, E. (2000) Debating the meaning of fMRI.
  - Aldridge, J.M. (2005) Correlation as causation (fMRI) letter.
  - Raichle, M.E. (2006) The brain's dark energy
- Assignment, Uncertainties in fMRI (5 points, see lecture and Discussion Room for details)
- Take quizzes until you can consistently score at a level that is satisfactory to you
- **Take Exam 2 (See calendar for due date)**

### Unit 3

- Read in textbook Chapters 15, 16, 17, and 18
- Lecture and comments on Chapters 15, 17, and 18
- Powerpoint file on Anatomy for Chapter 15
- Powerpoint file on Anatomy for Chapter 16 - 18
- Powerpoint file on Autonomic Nervous System
- Powerpoint file on The Sexual Brain
- Lecture, Reinforcement and the Ultimate Reinforcers
  - Kinsley, C.H. et al. (1999) Motherhood improves learning and memory. *Nature*, 402, 137.
  - LeVay, S. (1991) A difference in hypothalamic structure between heterosexual and homosexual men. *Science*, 253, 1034-1037.
  - Swaab, D.F., and Hofman, M.A. (1995) Sexual differentiation of the human hypothalamus in relation to gender and sexual orientation. *Trends in Neuroscience*, 18, 264-265.
  - Harlow, J. (1848) Passage of an iron bar through the head.
  - Harlow, J. (1868) Recovery from an iron bar.
  - Damasio, H. et al. (1994) The return of Phineas Gage.
  - Beckman, M. (2004) The mice that don't miss mom: Love and the mu-opioid receptor. *Science*, 304, 1888-1889.
- Assignment, the significance of Phineas Gage (3 points, see Discussion Room for details)

- Take quizzes until you can consistently score at a level that is satisfactory to you
- Take Exam 3 (See calendar for due date)

#### Unit 4

- Read in textbook Chapters 19, 20, 21, and 23
- Lecture and comments on Chapters 19, 20, 21, and 23
- Lecture, Medical Consequences of Circadian Rhythms
- Abbott, A (2003) Restless nights
- Lecture, The Neural Basis of Language
- Geschwind and Levitsky (1968) Human Brain: Left-right asymmetries in temporal speech regions.
- Extra credit , plasticity in binocular vision (2 points, see lecture for details)
- Take quizzes until you can consistently score at a level that is satisfactory to you
- Take Exam 4 (See calendar for due date)

#### Unit 5

- Read in textbook Chapters 22, 24, and 25
- Lecture and comments on Chapters 22, 24, and 25
- Rosenhan (1973) On being sane in insane places
- Scoville and Milner (1957) Loss of recent memory after bilateral hippocampal lesions. Including the 1995 interview.
- Olds & Milner (1954) Positive reinforcement produced by electrical brain stimulation.
- Miller (2005) The Dark Side of Glia
- Lecture, Biological Aspects of Schizophrenia
- Lecture, Classical Conditioning
- Lecture, Ultimate Reinforcers
- Extra credit , A child with HM's lesion (3 points, see lecture for details)
- Take quizzes until you can consistently score at a level that is satisfactory to you
- Take Exam 5 (See calendar for due date)

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