Natural Science II: Brain and Behavior
V55.0306 (001)
Prof. Paul Glimcher
4 Washington Place, 809

Lectures
Monday and Wednesday 2:00pm-3:15pm
Silver 207

Labs:
002: Wednesday 5:00-6:40    202 Silver
003: Thursday    9:00-10:40  202 Silver
004: Thursday    11:00-12:40 202 Silver
005: Thursday    1:00-2:40   202 Silver
006: Thursday    3:00-4:40   202 Silver
007: Thursday    5:00-6:40   202 Silver

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Texts
Required:

(Either the third or fourth editions, not the second!)
Lab Manual, available at the bookstore

Recommended, particularly for those who feel that their biology background is shaky: How The Brain Works. Mark Wm. Dubin. Blackwell Science.

Grading

Exams:
Midterm I 25%
Final Exam 50%

Laboratory
Quizzes 5%
Lab Reports 20%

Course Syllabus

Week 1
From Aristotle to Descartes and on to Sherrington and Cajal.
Readings: Chapter 1 (either edition)

Lab: No Lab, First Week

Week 2
Sept 11 Anatomy of Nervous System I: Cells
Readings: Chapter 2, 3rd ed. first half, 4th ed. second half

Sept 13 Anatomy of the Nervous System II: Gross Anatomy
Readings: Chapter 2, 3rd ed. second half, 4th ed. first half

Lab: The Scientific Method
Readings: Lab manual, Lab 1, handed out in lab

Week 3
Sept 18 Neurophysiology I: Ionic Batteries and Passive Conduction

Sept 20 Neurophysiology II: The Action Potential
Readings: CD-ROM, Chapter 3, Do all exercises and study guides under: "Electrical Signals are the Vocabulary of The Nervous System

Lab: Sheep Brain Dissection
Readings: Lab manual, **Lab 2**

**Week 4**
Sept 25 Neurophysiology III: Synapses and Circuits

Sept 27 Psychopharmacology I: Neurotransmitter Systems

Lab: Build Your Own Brain
Readings: Lab Manual, **Lab 3**

**Week 5**
Oct 2 Psychopharmacology II: Drugs

Oct 4 Hormones in General

Lab: Microscopic analysis of the Neuron
Readings: Lab manual, **Lab 4**

**Week 6**
Oct 10 No School

Oct 11 Specific Hormonal Systems

Lab: **Review for Midterm**

**Week 7**
Oct 16 – Midterm Exam

Oct 18 Evolution of the Brain and Behavior
Readings: Chapter 6 (either edition)

Lab: Electronic Conduction Lab
Readings: Lab manual, **Lab 5**

**Week 8**
Oct 23 Genetics and the Gross Anatomical Development of the Brain
Readings: Chapter 7, 3rd ed. pp 177-194; 4th ed. pp 183-197 (bottom)

Oct 25 Experience and the Fine Structure of the Brain

Lab: Sensory Perception I: Response Times in the Nervous System
Readings: Lab manual, Lab 6

Week 9
Oct 30 General Principles of Sensory Systems: Pain and Touch
Readings: Chapter 8

Nov 1 Hearing and Vestibular Sensation

Lab Sensory Perception II: Somatic Sensation
Readings: Lab manual, Lab 7

Week 10
Nov 6 The Chemical Senses, Taste and Smell

Nov 8 Vision, The Sense We Really Understand: Retina to Cortex

Lab: Sensory Perception III: Structural Limits of Vision
Readings: Lab manual, Lab 8

Week 11
Nov 13 Vision, The Sense We Really Understand: The Cortex and Perception
Readings: Chapter 10, 3rd ed. pp 298-321; 4th ed. 299-319

Nov 15 Movement Control: Sherrington, Descartes and Simple Circuits

Lab: Electrophysiology of the Roach Leg
Readings: Lab manual, Lab 9

Week 12
Nov 20 Movement Control II: Cortical Systems
Readings: Chapter 11, 3rd ed. pp 338-358; 4th ed. 332-351

Nov 23 Movement Control III: The Sociology of Science, A Case Study
Asanuma, Evarts and Georgopolus
Readings: Chapter 11, 3rd ed. pp 338-358; 4th ed. 332-351
No Lab: Thanksgiving Vacation

Week 13
Nov 27 Movement Control III: The Sociology of Science, A Case Study
Asanuma, Evarts and Georgopolus
Readings: Chapter 11, 3rd ed. pp 338-358; 4th ed. 332-351

Nov 29 General Theories of Emotion
Readings: Chapter 15, Read it all but with an emphasis on 3rd ed. pp 469-483; 4th ed. pp 459-470

Lab: Behavioral Studies: Rats in Open Field Environments
Readings: Lab manual, Lab 10

Week 14
Dec 4 The Study of Fear
Readings: LeDoux Scientific American Article

Dec 6 Learning and Memory I: Memory Systems of the Brain
Readings: Chapter 17, emphasis on 3rd ed. pages 537-555; 4th ed. pages 523-539

Lab: Review for Final Exam

Week 15
Dec 11 Learning and Memory II: Hebb and LTP
Readings: Chapter 18, emphasis on 3rd ed. pages 571-589. 4th ed. pages 553-568. CD-ROM Tutorial (3rd) 18.1; (4th) 18.2

Dec 13 The Neurobiology of Love
Readings: None

Dec 15 - 22: Final Exam Period