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

Lectures
Monday and Wednesday 3:30pm-4:45pm
Silver 207

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

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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 shakey:
Grading

Exams:
Midterm I 25%
Final Exam 50%

Laboratory
Quizzes 5%
Lab Reports 20%

Course Syllabus

Week 1
Sept 7 Introduction, The Enlightenment and the Birth of Neuroscience.
From Aristotle to Descartes and on to Sherrington and Cajal.
Readings: Chapter 1 (either edition)

Lab: No Lab, First Week

Week 2
Sept 12 Anatomy of Nervous System I: Cells
Readings: Chapter 2, 3rd ed. first half, 4th ed. second half

Sept 14 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 19 Neurophysiology I: Ionic Batteries and Passive Conduction

Sept 21 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 26 Neurophysiology III: Synapses and Circuits
Sept 28 Psychopharmacology I: Neurotransmitter Systems  

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

**Week 5**

Oct 3 Psychopharmacology II: Drugs  

Oct 5 Hormones in General  

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

**Week 6**

Oct 10 No School

Oct 12 Specific Hormonal Systems  

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

**Week 7**

Oct 17 Evolution of the Brain and Behavior  
Readings: Chapter 6 (either edition)

Oct 19 Genetics and the Gross Anatomical Development of the Brain  
Readings: Chapter 7, 3rd ed. pp 177-194; 4th ed. pp183-197 (bottom)

Lab: Review for Midterm

**Week 8**

Oct 24 Midterm Exam

Oct 26 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 31 General Principles of Sensory Systems: Pain and Touch
Readings: Chapter 8

Nov 2 Hearing and Vestibular Sensation

Lab Sensory Perception II: Somatic Sensation
Readings: Lab manual, **Lab 8**

**Week 10**
Nov 7 The Chemical Senses, Taste and Smell

Nov 9 Vision, The Sense We Really Understand: Retina to Cortex

Lab: Sensory Perception III: Structural Limits of Vision
Readings: Lab manual, **Lab 7**

**Week 11 SfN**
Nov 14 Vision, The Sense We Really Understand: The Cortex and Perception

Nov 16 Movement Control: Sherrington, Descartes and Simple Circuits

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

**Week 12**
Nov 21 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 28 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

Nov 30 The Study of Fear
Readings: LeDoux Scientific American Article

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

**Week 14**
Dec 5 Learning and Memory I: Memory Systems of the Brain
Readings: Chapter 17, emphasis on 3rd ed. pages 537-555; 4th ed. pages 523-539

Dec 7 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

Lab: Review for Final Exam

**Week 15**
Dec 12 The Neurobiology of Love
Readings: None

**Dec 16 - 23: Final Exam Period**