Natural Science II: Brain and Behavior
V55.0306 (006)

Prof. Paul Glimcher
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Grad Teaching Assistants

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Texts

Required:

Grading

Exams:
Midterm I 25%
Final Exam 50%

Laboratory
Quizzes 5%
Lab Reports 20%

Course Syllabus

Week 1
Jan 21 Introduction, The Enlightenment and the Birth of Neuroscience.
From Aristotle to Descartes and on to Sherrington and Cajal.
Readings: Chapter 1, pp1-21
Lab: No Lab, First Week

**Week 2**

Jan 26 Anatomy of Nervous System I: Cells  
Readings: Chapter 2, first half

Jan 28 Anatomy of the Nervous System II: Gross Anatomy  
Readings: Chapter 2, second half

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

**Week 3**

Feb 2 Neurophysiology I: Ionic Batteries and Passive Conduction  
Readings: Chapter 3, pp 58-72

Feb 4 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**

Feb 9 Neurophysiology III: Synapses and Circuits  
Readings: Chapter 3, pp 73-85

Feb 11 Psychopharmacology I: Neurotransmitter Systems  
Readings: Chapter 4, pp 87-98.

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

**Week 5**

Feb 16 President’s Day, No Class

Feb 18 Psychopharmacology II: Drugs  
Readings: Chapter 4, pp 100-115. CD-ROM Tutorial 4.1

Lab: No Lab, President’s Day Week

**Week 6**

Feb 23 Hormones in General  
Readings: Chapter 5, pp 117-130
Feb 25 Specific Hormonal Systems
Readings: Chapter 5, pp 131-146. CD-ROM Tutorial 5.1

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

Week 7

Mar 1 Evolution of the Brain and Behavior
Readings: Chapter 6

Mar 3 Midterm

Lab: Review for Midterm

Week 8
Mar 8 Genetics and the Gross Anatomical Development of the Brain
Readings: Chapter 7, pp 177-194

Mar 10 Experience and the Fine Structure of the Brain
Readings: Chapter 8, pp 194-210

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

Mar 15-21: Spring Recess

Week 9
Mar 22 General Principles of Sensory Systems: Pain and Touch
Readings: Chapter 8

Mar 24 Hearing and Vestibular Sensation
Readings: Chapter 9, pp 247-268

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

Week 10
Mar 29 The Chemical Senses, Taste and Smell
Readings: Chapter 9, pp 269-279

Mar 31 Vision, The Sense We Really Understand: Retina to Cortex
Readings: Chapter 10, pp 281-298

Lab: Sensory Perception II: Structural Limits of Vision
Readings: Lab manual, Lab 7
Week 11
Apr 5 Vision, The Sense We Really Understand: The Cortex and Perception
Readings: Chapter 10, pp 298-321

Apr 7 Movement Control: Sherrington, Descartes and Simple Circuits
Readings: Chapter 11, pp 324-338

Lab Sensory Perception III: Somatic Sensation
Readings: Lab manual, Lab 8

Week 12
Apr 12 Movement Control II: Cortical Systems
Readings: Chapter 11, pp 338-358

Apr 14 Movement Control III: The Sociology of Science, A Case Study
Asanuma, Evarts and Georgopolus
Readings: Chapter 11, pp 338-358

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

Week 13
Apr 19 General Theories of Emotion
Readings: Chapter 15, Read it all but with an emphasis on pp 469-483

Apr 21 The Study of Fear
Readings: LeDoux Scientific American Article

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

Week 14
Apr 26 Learning and Memory I: Memory Systems of the Brain
Readings: Chapter 17, emphasis on pages 537-555

Apr 28 Learning and Memory II: Hebb and LTP
Readings: Chapter 18, emphasis on pages 571-589. CD-ROM Tutorial 18.1

Lab: Review for Final Exam

Week 15
May 3 The Neurobiology of Love
Readings: None
May 7 - 14: Final Exam Period