Text:

Lieberman DA: *Learning and Memory. An Integrative Approach.*
Thomson Learning, Belmont, CA 2004
ISBN/ISSN 019514175X

NOTE: Additional readings will be assigned and made available to students to photocopy.

Course Requirements:
Tests: There will be a MIDTERM AND FINAL; they will constitute 50% of your grade

Participation: Students are expected to attend and participate in each class. Participation will count 20% of your grade.

Final paper: There will be a 5-10 page paper that will be 30% of your grade

Learning can be seen as a strategy to manage environmental variance which provides an organism with a set options that other organisms within in the same environment may not have. Evolution therefore provides a mechanism which is both stationary and yet dynamic with potential for compensating to rapid environmental change or stress. Learning processes are ubiquitous throughout cognitive and perceptual function constraining such diverse processes such as object recognition, syntax acquisition and memorial stability.

In this course we will examine Learning theory at multiple levels of analysis and in different species including machines. We will focus on both the adaptive nature of learning strategies as well as their representational properties. We will consider specific perceptual and cognitive function and their relation to learning. Although there will be some math and computer science in the course, it will be minimal and require no specific pre-requisites other than college algebra or calculus.
Class Topics:

1/18 Week 1: Introduction. no reading
1/23 Week 2: Classical Roots of Learning Theory: Empiricism; Associationism; Hume, Descartes
2/6 Week 3: Emergence of the Science of Learning: Darwin & Evolution;
2/13 Week 4: Pavlov & Conditioning-I Thorndike & the Law of Effect;
2/20 Week 5: Skinner & Reinforcement Theory; Herrnstein & Choice
2/27 Week 6: Neurons, synapses, circuits and Learning, Hebb; Rosenblatt; LTP; Conditioning-II

MIDTERM—March 8th Review March 6th

3/13 Week 7: Perceptual learning: Selective Attention
3/20 Week 8: Cognitive processes: Encoding & Memory
3/27 Week 9: Concept Learning & Categorization: Early Categorization theory
4/10 Week 11: Cognitive Neuroscience and learning
4/17 Week 12: PDP: Network Models of Learning
4/23 Week 13: Computational Learning Theory

May 4th--10th FINAL --FINAL PAPER DUE.