

## 830: 578 Cognitive Neuroscience of Learning and Memory

Instructors: S. Hanson and C. Hanson

*Cognitive Neuroscience of Learning and Memory.*

*Course Goals:* This course is focused on Learning and memory and various brain function that supports and enables these basic cognitive functions. We will review classic and recent papers on fundamental issues and concepts of learning and memory and their relation to known brain function and structure. Topics will include basic memory frameworks, simple learning brain mechanisms, various memory systems, dissociation logic, encoding/retrieval, amnesia and general frameworks and metaphors of learning and memory in the brain.

*Course Plan:* This course will be run as a graduate seminar, students will be expected to read and present various topics and engage in discussion and debate about various topics listed below. There will be introductory lectures on basic memory and learning frameworks as well as basic brain structure and function.

*Evaluation:* Students will be expected to write a short position paper per class and be prepared to present readings and discussion of reading materials.

Date Week	Topic	Readings
1/19	Intro to cognitive neuroscience of memory	No readings
1/26	Basic model of information flow, memory metaphors and frameworks	Eichenbaum, Chap 1, Squire & Kandel Chap1. Original Articles: Bartlett, Ebbinghaus
2/2	Overview of memory systems, metacognition and General Concepts	Schacter, 1999; Gabrieli 1998; Richardson et al 1998; Squire (2004).
2/9	Overview of the cognitive neuroscience approach Brain anatomy and basic function	Squire & Kandel, Ch. 2 Friston, 2001; Other Readings
2/16	Simple Learning Systems & The neuronal basis of memory: Synaptic and cortical plasticity	Squire & Kandel, Ch. 3, Pavlov, Other Readings
2/23	Computational Models; AI and Connectionist Theory and Metaphors for Memory and Learning	Rummelhart & McClelland Ch. 1 Ch. 2 Hanson & Burr 1989; Hanson & Hanson 1990; other Readings.
3/2	Behavioral characterization of STM/WM and inhibition The neural basis of STM/WM	Baddeley, 2003; Hasher & Zacks, 1988 Smith & Jonides, 1999; other Readings.
3/9	Encoding and accessing information	Neath & Surprenant Ch. 5; Roediger & Guynn, 1996 ther Readings
3/16	Retrieval processes and forgetting	Wixted, 2004; Bjork, Bjork & Anderson, 1998 Other Readings
3/23	Memory systems and dissociation logic	Roediger, 1990; Yonelinas, 2002, Other Readings
3/30	Memory, development, and dissociations of memory	Zacks & Hasher, 2006; Ornstein et al., 2006; Jacoby & Rhodes, 2006
4/6	Amnesia and the neural basis of declarative memory	Squire & Kandel, Ch. 5 Other Readings
4/13	Repetition priming	Henson, 2003, Other Readings
4/20	Skill acquisition (Implicit Learning)	Knowlton et al., 1996; Poldrack & Willingham, 2004
4/27	Models of memory and evaluation of memory systems approaches	Neath & Surprenant Chapter; Knowlton, 1999; Nosofsky & Zaki, 1999; Other Readings
5/4	Final Project Reports	Students make short presentations on project

