

## Psychology W2215y. Cognition: Mind & Brain. Spring 2005

---

### **I. Course description**, as it will appear in the Bulletin:

#### **W2215y. Cognition: Mind & Brain**

3 pts. E. Smith. MW 10:35-11:50 Room 501 Schermerhorn Hall

Prerequisite: PSYC 1001 or 1010 (recommended) or the instructor's permission.

How mental activities – particularly human cognitive processes – are implemented in the brain, with some emphasis on methods and findings of neuroscience. Topics include long-term and working memory, attention and executive processes, concepts and categorization, decision-making, and language.

### **II. The rationale for giving the course**, its role in the overall curriculum, and its relationship to any specific departmental major, degree program, specialization, or concentration.

This undergraduate lecture course will complement our curriculum in a number of important ways. It will provide students with a solid foundation in the important new field of cognitive neuroscience, from which they will be able to pursue a number of advanced seminars and research opportunities within the department.

PSYC W2215 will fulfill the following degree requirements:

- For the Psychology major or concentration in the College and in G. S., for the Psychology minor in Engineering, and for the Psychology Post-bac, PSYC W2215 will meet the Group I (Perception and Cognition) distribution requirement.
- For the Neuroscience and Behavior joint major, PSYC W2215 will meet the fourth Psychology requirement: *“One additional 2000 or 3000 level psychology course from a list approved by the Psychology Departmental advisor to the program.”*
- For the science requirements of the College and G. S., PSYC W2215 will count as a single term of the requirement, provided that students who do not have the designated prerequisite obtain instructor permission. Ideally, students will have taken both PSYC W1010 (recommended) and PSYC 1001 prior to PSYC W2215, and will thereby have fulfilled two terms of the science requirement.

We will initially cap enrollment at 95.

### **III. A full description of the content of the course**

This course is an introduction to cognitive psychology and cognitive neuroscience, an interdisciplinary area of study that represents an attempt by cognitive psychologists and neuroscientists to discover how mental activities are implemented in the brain. The approach focuses on human cognitive processes and relies heavily on human behavioral techniques and the methods and findings of neuroscience.

This course will explore the relations between neural systems and cognition, emphasizing: perception, attention, long term memory, working memory, executive processes, concepts and categorization, and decision making; students will be introduced to some basic neuroanatomy, to functional imaging techniques, and to behavioral measures of cognition. We will discuss methods by which inferences are made about the neural bases of cognition, considering evidence from patients with neurological diseases (e.g. amnesia, focal lesions from stroke, Alzheimer's Disease), and from neuroimaging normal human participants.

### **IV. Course requirements:**

Grading: Grades will depend on three factors: midterm exam (30%), final exam (40%), and a short (6-8 pages) term paper (30%).

**V. Course outline:**

**Week 1**

Course introduction, historical overview  
*Overview of cognitive neuroscience*

**Week 2**

Basics of perception; object identity and spatial position  
*Object recognition: Visual processing*

**Week 3**

Object recognition: Conceptual representations  
Object recognition: Conceptual representations, continued

**Week 4**

Long-term memory (LTM): Different kinds of memory  
LTM, continued: Stages of explicit memory

**Week 5**

LTM: Role of emotion  
Working memory (WM): Different kinds of memory

**Week 6**

WM: Storage and processing  
Executive processes: Attention and inhibition

**Week 7**

Executive processes, continued  
Review

**Week 8**

**MIDTERM**  
WM and executive processes: Effects of aging

**Week 9**

Decision-making: Basics  
Decision-making: Role of emotion

**Week 10**

Reasoning: Intuitive vs. analytical thought  
Reasoning: cultural variations

**Week 11**

Problem solving: General heuristics  
Problem solving: Expertise

**Week 12**

Problem solving: Imagery  
Language: Overview and syntactic processes

**Week 13**

Language: Words and rules  
Language: Breakdowns (aphasias)

**Week 14**

Review

**Week 15**

**FINALS WEEK**

**Reading List:**

The readings will consist of: (1). Chapters from an in press textbook on Mind and Brain; (2). Additional papers that provide literature reviews or research articles; and (3). 2-3 suggested additional readings for interested students, and for guiding term papers. All readings will be available on the web.

**Textbook:**

Smith, E. E. and Kosslyn, S. M. (2005). Cognitive Psychology: Mind and Brain. New Jersey: Prentice Hall. (hereafter, S&K).

**Supplemental recommended books (but copies will be on reserve):**

Pinker, S. (1997). How the Mind Works. New York: Norton. ["HTMW" in list below]

Pinker, S. (1994). The Language Instinct. New York: William Morrow.