Psychology 127: Cognitive Neuroscience

Fall Semester 2000

Time and Place:

Lecture:	Monday/Wednesday 1:10 pm - 2:00 pm GPB 100		
Sections:	Monday, 3:10 - 4:00 pm	Tolman 3140	Sagiv
	Monday, 4:10 - 5:00 pm	Tolman 3140	Sagiv
	Tuesday, 12:10 - 1:00 pm	Tolman 3112	Nelson
	Tuesday, 1:10 - 2:00 pm	Tolman 3112	Nelson

Instructor:	Richard Ivry
Office:	Tolman Hall 3431
Phone:	642-7146
email:	ivry@socrates.berkeley.edu
Office Hours:	Wednesday 2:15 - 4:00 pm (Feel free to set up appointments by email.)

Teaching assistants:	Rolf Nelson	Noam Sagiv
Office:	Tolman 5403	Tolman G8 (Ground Floor)
Phone:	642-1886	email only
email:	rnelson@socrates	noam127@yahoo.com
Office Hours:	Wednesday 3:00 - 4:00 pm	Monday 5:10 - 6:00 pm

Website:	http://socrates.berkeley.edu/~noam/127.html
Textbook:	Gazzaniga, Ivry, and Mangun Cognitive Neuroscience: The Biology of the Mind Available at ASUC Bookstore
Reader:	Available at Krishna Copy, 2111 University Av. (540-5959)

Copies of both the text and reader will be on reserve in the Ed-Psych Library (Tolman Hall, 2nd floor). If all goes as expected, copies of the old exams, lecture outlines, and lecture overheads will be on the website.

Important dates:

Exam 1:	Monday, October 2nd in class
Exam 2:	Monday, November 6th in class
Exam 3:	Wednesday, December 6th in class
Anatomy Quiz:	Sections, Week of September 25th
WEB Reports	Sections, Week of October 23rd
Research Proposals	Sections, Week of November 13th
Term Paper:	Wednesday, November 29th. Due at beginning of class.

Course grading:

The exams and paper will be weighted as follows:

First Midterm:	22%
Second Midterm:	22%
Third Exam:	22%
Anatomy Quiz:	3%
WEB Reports	3%
Research Proposals	7%
Term paper:	21%

Grading will most likely be on a straight curve (e.g., B's between 80-89.9), but grades will be curved up if the median of the final distribution is below 80. Under no circumstances will grades be curved down.

Exams:

There will be three in-class midterm exams. Each exam will be composed of three parts: 1) multiple choice; 2) short identifications; 3) one essay. There will be a choice for both the identifications and essays (e.g., choose 1 of 2 essays). The third midterm will be given during the scheduled slot for the final exam, although only 2 hours of the time will be provided. It will not be a cumulative final.

Make-up exams are not given except under emergency situations. In such circumstances, the student is responsible for notifying the instructor prior to the exam or as soon thereafter as possible. I will not offer make-ups under any circumstances when there is a substantial delay in notification.

Term paper:

The goal of the paper is to get students to read original research articles with a focus on the methods used to investigate the question under consideration. The term paper will be a literature review of a topic of the student's choice. The term paper will be an 8-10 double-spaced page paper. It should include multiple (minimum of eight) references. Late papers will be penalized. A detailed description of the paper will be provided later in the semester.

Sections:

Most of the sections will provide an opportunity to discuss the readings as well as review material presented in class. Study questions will be handed out at Monday lectures in advance of the discussion sections for that week. These questions are for study purposes only and will not be graded. However, they are likely to appear in some form on the exams as will material from the Reader articles.

In addition, there will be three assignments due in section. The first will be a short quiz on neuroanatomy, designed to ensure that you have the essential brain basics in hand. The second will be an oral report based on your search of the Internet for WEB sites that are relevant to the course. This assignment is intended to promote the use of new resources. The third will be an oral report in which you present a research proposal. We expect that it will be acceptable to work in pairs for both of the oral presentations. The section assignments will be described in handouts to be provided later in the semester.

Lectures and Readings

Date	Topic	Prepare
8/28/00	What is cognitive neuroscience?	
8/30/00	Methods of neuroscience	GAZ 1
9/06/00	Methods of neurology	GAZ 2
9/11/00	Methods of cognitive psychology	GAZ 3:69-102
9/13/00	Methods of cognitive neuroscience	GAZ 3: 102-120 Reader #1 and #2
9/18/00	Perception: The visual system	GAZ 4
9/20/00	Perception: Feature analysis	Reader #3 and #4
9/25/00	Perception: Object recognition	GAZ 5:163-197 Reader #5
***** Week of Sept. 25: Anatomy Quiz in Sections		
9/27/00	Perception: Are faces special?	GAZ 5:198-205 Reader #6
10/02/00	Exam 1	
10/04/00	Attention: Pathways and disorders	GAZ 6
10/09/00	Attention: Component analysis	Reader #7 and #8
10/11/00	Consciousness: Perception and awareness	GAZ 14 Reader #9
10/16/00	Memory: Pathways and disorders	GAZ 7
10/18/00	Memory: Functional dissociations	Reader #10 and #11
10/23/00	Memory: Long-term knowledge	Reader #12 and #13
***** Week of Oct. 23: WEB Reports in Sections		
10/25/00	Language: Pathways and disorders	GAZ 8
10/30/00	Language: Functional analysis	Reader #14 and #15
11/01/00	Language and hemispheric specialization	GAZ 9
11/06/00	Exam 2	
11/08/00	Motor control: Pathways and disorders	GAZ 10: 371-399
11/13/00	Motor control: Representation of action	GAZ 10: 400-421

***** Week of Nov. 13: Research Proposals in Sections

11/15/00	Motor control: Component analysis	Reader #16 and #17
11/20/00	Executive functions: Working memory	GAZ 11: 423-444 Reader #18
11/22/00	Executive functions: Selection of action	GAZ 11: 445-464 Reader #19
11/27/00	Social and emotional mediation of behavior	GAZ 13 Reader #20 and Reader #21
11/29/00	Development and plasticity	GAZ 12 Reader #22

***** Term paper due at beginning of class

12/04/00	Mechanims of plasticity
12/06/00	Exam 3 (NOTE: Last class, not final exam slot)

Reader:

1. D'Esposito, M. et al. (1999). Psychological Bulletin, 125: 155-164.
2. Klein, E. et al. (1999). Archives of General Psychiatry, 56: 315-320.
3. Kourtzi, Z. and Kanwisher, N. (2000). Journal of Cognitive Neuroscience, 12: 48-55.
4. Schmolesky, M.T. et al. (2000). Nature Neuroscience, 3: 384-390.
5. Behrmann, M. et al. (1994). J of Exp. Psych: Human Perception & Performance, 20: 1068-1087.
6. Gautheier, I. et al. (1999). Nature Neuroscience, 2: 568-573.
7. Berti, A. and Frassinetti, F. (2000). Journal of Cognitive Neuroscience, 12: 415-420.
8. Roelfsema et al. (1998). Nature, 395: 376-381.
9. Dehaene et al. (1998). Nature, 395: 597-600.
10. Rugg, M.D. et al. (1998). Nature, 392: 595-598.
11. Fernandez, G. et al. (1999). Science, 285: 1582-1585.
12. Rampon, C. et al. (2000). Nature Neuroscience, 3: 238-244.
13. Maquet, P. et al. (2000). Nature Neuroscience, 3: 831-836.
14. Paulesu, E. et al. (2000). Nature Neuroscience, 3: 91-96.
15. Dronkers, N. (1996). Nature, 384: 159-161.
16. Desmurget et al. (1999). Nature Neuroscience, 2: 563-567.
17. Chapin et al. (1999). Nature Neuroscience, 2: 664-670.
18. Prabhakaran, V. et al. (2000). Nature Neuroscience, 3: 85-90.
19. Luu, P. et al. (2000). Journal of Neuroscience, 20: 464-469.
20. Baxter, M. et al. (2000). Journal of Neuroscience, 20: 4311-4319.
21. Anderson, S. et al. (1999). Nature Neuroscience, 2: 1032-1037.
22. Pantev, C. et al. (1998). Nature, 392: 811-814.

Full Citations for Reader Articles:

1. D'Esposito, M. et al. (1999). Event-related functional MRI. Psychological Bulletin, 125: 155-164.
2. Klein, E. et al. (1999). Therapeutic efficacy of right prefrontal slow repetitive transcranial magnetic stimulation in major depression. Archives of General Psychiatry, 56: 315-320.
3. Kourtzi, Z. and Kanwisher, N. (2000). Activation in human MT/MST by static images with implied motion. Journal of Cognitive Neuroscience, 12: 48-55.
4. Schmolesky, M.T. et al. (2000). Degradation of stimulus selectivity of visual cortical cells in senescent rhesus monkeys. Nature Neuroscience, 3: 384-390.
5. Behrmann, M. et al. (1994). Intact visual imagery and impaired visual perception in a patient with visual agnosia. Journal of Exp. Psych: Human Perception & Performance, 20: 1068-1087.
6. Gautheier, I. et al. (1999). Activation of middle fusiform "face area" increases with expertise in recognizing novel objects. Nature Neuroscience, 2: 568-573.
7. Berti, A. and Frassinetti, F. (2000). When far becomes near: Remapping of space by tool use. Journal of Cognitive Neuroscience, 12: 415-420.
8. Roelfsema et al. (1998). Object-based attention in the primary visual cortex of the macaque monkey. Nature, 395: 376-381.
9. Dehaene et al. (1998). Imaging unconscious semantic priming. Nature, 395: 597-600.
10. Rugg, M.D. et al. (1998). Dissociation of the neural correlates of implicit and explicit memory. Nature, 392: 595-598.
11. Fernandez, G. et al. (1999). Real-time tracking of memory formation in the human rhinal cortex and hippocampus. Science, 285: 1582-1585.
12. Rampon, C. et al. (2000). Enrichment induces structural changes and recovery from nonspatial memory deficits in CA1 NMDAR1-knockout mice. Nature Neuroscience, 3: 238-244.
13. Maquet, P. et al. (2000). Experience-dependence changes in cerebral activation during human REM sleep. Nature Neuroscience, 3: 831-836.
14. Paulesu, E. et al. (2000). A cultural effect on brain function. Nature Neuroscience, 3: 91-96.
15. Dronkers, N. (1996). A new brain region for coordinating speech articulation. Nature, 384: 159-161.
16. Desmurget et al. (1999). Role of the posterior parietal cortex in updating reaching movements to a visual target. Nature Neuroscience, 2: 563-567.
17. Chapin et al. (1999). Real-time control of a robot arm using simultaneously recorded neurons in the motor cortex. Nature Neuroscience, 2: 664-670.
18. Prabhakaran, V. et al. (2000). Integration of diverse information in working memory within the frontal lobe. Nature Neuroscience, 3: 85-90.
19. Luu, P. et al. (2000). Medial frontal cortex in action monitoring. Journal of Neuroscience, 20: 464-469.
20. Baxter, M. et al. (2000). Control of response selection by reinforcer value requires interaction of amygdala and orbital prefrontal cortex. Journal of Neuroscience, 20: 4311-4319.
21. Anderson, S. et al. (1999). Impairment of social and moral behavior related to early damage in human prefrontal cortex. Nature Neuroscience, 2: 1032-1037.
22. Pantev, C. et al. (1998). Increased auditory cortical representation in musicians. Nature, 392: 811-814.