

Syllabus for PSYC 6338 (Neural and Cognitive Modeling), Spring 2008

“INCM” refers to Levine, *Introduction to Neural and Cognitive Modeling*

“*” means that the article will be posted on the WebCT site and one of the students will lead class discussion of the article

Dates	General Topics	Readings
1/14-1/16	Overview, history, philosophy Methodology	INCM, Preface, Flowchart INCM, Chs. 1-2
1/23-1/28	Some current outlooks	PDP book, Ch.1* Grossberg web site* Grossberg, <i>Trends in Cog Sci</i> , 2000*
1/30-2/4	Computation and math	INCM, pp. 396-410 Introduction to MATLAB
2/6-2/11	Pattern perception and learning	INCM, pp. 41-49, 77-80 Grossberg lecture notes, Ch. 2*
2/13-2/18	More on perception and vision	INCM, pp. 95-128, 140-143 Grossberg & Mingolla, <i>Psych Rev</i> , 1985*
2/20-2/27	Categorization	INCM, pp. 57-60, 83-84 INCM, pp. 198-221, 226-235, 237-244 Rumelhart et al., PDP book, Ch. 8* Carpenter & Grossberg, <i>Comp Vis</i> , 1987* Anderson et al, <i>Psych Rev</i> , 1977
2/27	TAKE HOME MIDTERM, DUE 3/3	
3/3-3/10	Models of memory	Article on SAM model (TBA)* Article on fuzzy trace theory (TBA)* Grossberg article (TBA)*
3/12, 24-26	Models of decision making	Grossberg & Gutowski, <i>Psych Rev</i> , 1987* Busemeyer & Townsend, <i>Psych Rev</i> , 1993* Heyman et al., <i>Motivation & Emotion</i> , 2004*
3/17-3/19	SPRING BREAK	
3/31-4/7	Models of conditioning	INCM, pp. 55-65 INCM, pp. 160-176 Sutton & Barto, <i>Psych. Rev.</i> , 1981* Grossberg & Levine, <i>Applied Optics</i> , 1987* Grossberg & Schmajuk, <i>Psychobiol.</i> , 1987*

4/9-4/16	Cognitive models of brain regions	INCM, pp. 375-395 Frank & Claus, <i>Psych. Rev.</i> , 2006* Brown et al., <i>J. Neurosci.</i> , 1999* Armony et al., <i>Behav. Neurosci.</i> , 1995*
4/21-4/23	Models of neurons	Parts of Dayan & Abbott book, MIT Press Articles TBA
4/28-4/30	IN-CLASS TERM PROJECT PRESENTATIONS	

Homework: A few conceptual and computational problems from INCM will be given every 2-3 weeks. MATLAB programs (outstar, on-center off-surround field, and Sutton-Barto conditioning model) will be due on May 9.

Term project: This could either involve computations, literature review, suggestions for modeling, etc., and can cover any area of psychological, engineering, biological, or theoretical aspects of neural networks. Please turn in your project idea by Spring Break. Term paper (length 8-10 pp. single-spaced or 16-20 double-spaced) is due May 9. Grade is on conceptual depth and writing style of the written paper, and NOT on the in-class presentation part!

Grading: Midterm 100 pts.; Term project 100 pts.; Homework 50 pts.