Cog Sci 100-02 Syllabus — 11 September 08 version
Introduction to Cognitive Science

Venue: Olmsted 301
Class time: MW 9:00 to 10:15 a.m.
Professor: John Long (jolong@vassar.edu; office: Olmsted 317)
Office hours: M & T, 10:15 a.m. to 12 noon, or by appointment, in Olmsted 317

Intern: Laura Michaelson (lamichaelson@vassar.edu)

Date	Day		Topic	Readings (those from required books in **BOLD**; others available as pdfs on Blackboard)
9/3	W	1	What is Cognitive Science?	—
9/8	M	2	Of what stuff is mind?	**Crane (2003), Intro (Pp 1-7), Ch 2 (Pp 42-47)**; Gray *et al*. 2007; Livingston (unpubl.).
9/10	W	3	The material mind = brain?	**Crane (2003), Ch. 2 (Pp 48-82)**; Churchland, Paul (1988), Pp 7-35.
9/15	M	4	Studying minds: reductionism.	Sobel (2001) Pp 103-136; Zeman (2002) Ch 2.
9/17	W	5	Reductionism at work.	Churchland, Paul (1995), Ch 2; Dowling (1998), Ch 4.
9/22	M	6	Property dualism, intentionality, and qualia.	**Crane (2003), Ch 1 (Pp 8-32 & 36-41)**; Jackson (1991) Pp 392-395.
9/24	W	7	More critiques of reductionism.	Churchland, Pat (2002) Pp 127-148 & 173-199; Nagel (1974) Pp 422-429.
9/29	M	8	Functionalism: information, representation, computation.	Churchland, Paul (1988), Pp 36 -49; Haugeland (1997); Pfeifer & Scheier (1999), Ch 2.
10/1	W	9	Turing machines and AI.	**Crane (2003), Ch 3, Pp 83-118**; Barwise & Etchemendy (1994).
10/6	M	10	Functionalism critiqued.	**Crane (2003), Ch 3, Pp 118-128**; Searle (1990); Turing (1950).
10/8	W	11	Can computers be minds/persons?	**Lieber (1985).**
10/13	M	12	Brain-inspired computation.	**Crane (2003) Ch 4, Pp 159-167**; Hawkins & Blakeslee, Prologue, Chs 1 & 2.
10/15	W	13	Connectionism.	Stufflebeam (2008)
10/20	M		**Fall Break**	
10/22	W		**Fall Break**	
10/27	M	14	AI: Mind in Action	Brooks (2003) Ch 3; Dennett (1978); Pfeifer & Scheier (1999), Ch 3.
10/29	W	15	AI: Mind in Perception	Gazzinagi (1999), Pp 157-171,
11/3	M	16	No mind: perception-action loops.	Matarick (1998); Webb (2002).
11/5	W	17	Perception-cognition-action loops.	Brooks (2003), Ch 4; Goldstone & Barsalou (1998)
11/10	M	18	*Memoria et inventio*.	**Hawkins & Blakeslee, Chs 3-5**; Collins & Qullian (1969); Shepard & Metzler (1971).
11/12	W	19	Design for a memory-based prediction machine	**Hawkins & Blakeslee, Ch 6.**
11/17	M	20	Thinking	**Hawkins & Blakeslee, Ch 7, 8, epilogue.**
11/19	W	21	Making decisions from predictions	**Montague (2006), Chs 1 to 3.**
11/24	M	22	Evaluating values	**Montague (2006), Chs 4 & 5.**
11/26	W	23	Long-term decisions	**Montague (2006), Chs 6, 8, epilogue.**
12/1	M	24	The value of volition	Obhi & Haggaard (2004); Vohs & Schooler (2008).
12/3	W	25	Putting it into words	Abrams (2008)
12/8	M	26	Whither Cognitive Science?	Vinge (2008); Connell & Livingston (2008)

Required Texts (in **bold** above)
Crane, T. (2003). *The Mechanical Mind. 2nd Ed*. New York: Routledge.
Hawkins, J. and Blakeslee, S. (2004). On Intelligence. New York: Henry Holt & Company.
Leiber, J. (1985). *Can Animals and Machines Be Persons?* Hackett Press.
Montague, R. (2006). *Your Brain is (Almost) Perfect: How We Make Descisions*. USA: Penguin.

Readings on Blackboard

Abrams, L. (2008). Tip-of-the-tongue states yield language insights. *Am. Sci*.
Barwise, J. & Etchemendy, J. (1994). Turing's World 3.0. Stanford, CA: CSLI Publications.
Brooks, R. (2003). *Flesh and Machines: How Robots Will Change Us*. Cambridge, MA: MIT Press. Chs 3 & 4.
Churchland, Pat (2002). *Brain-Wise*. Cambridge, MA: MIT Press, Ch 2 (only Pp 127-148 & 173-191).
Churchland, Paul (1988). *Matter and Consciousness, Revised Ed*. Cambridge, MA: Bradford Press. Pp 7-35.
Churchland, Paul (1995). *The Engine of Reason, the Seat of the Soul*. Cambridge, MA: MIT Press. Ch 2.
Collins, A.M. and Qullian, M.R. (1969). Retrieval time from semantic memory. J. Verbal Learning and Verbal Behavior 8 240-247.
Connell, J. and Livingston, J. (2008). Four paths to AI. *AGI-08 Conf. on Artificial General Intelligence*.
Dennett, D. (1978). Where am I? In D. Dennett, *Brainstorms*. Montgomery, VT: Bradford Books. Pp 310-323.
Dowling, J. (1998). *Creating Mind*. New York: Harcourt-Brace, Ch 4.
Gazzaniga, M. (1999). What are brains for? In R. Solso (Ed.) *Mind and Brain Sciences in the 21st Century*. Cambridge: MIT Press, Pp 157-171.

Goldstone, R. and Barsalou, L. (1998). Reuniting perception and conception. *Cognition* 65, 231-262.
Gray, H., Gray, K. and Wegner, D. (2007). Dimensions of mind perception. *Science* 315, 619.
Haugeland, J. (1997). What is mind design? In J. Haugeland (Ed.) *Mind Design II: Philosophy, Psychology, AI*. MIT Press. Pp 1-28.
Jackson, F. (1999). What Mary didn't know. In D. Rosenthal (Ed.) *The Nature of Mind*. Oxford, Oxford Univ. Press, Pp 392-395.
Livingston, K. (unpublished). What is mind that thou art mindful of it?
Mataric, M.J. (1998). Behavior-based robotics as a tool for synthesis of artificial behavior … analysis of natural behavior. *Trds. Cog. Sci.* 2(3), 82-87.
Nagel, T. (1974). What is it like to be a bat? *Phil. Review.*
Obhi, S.S. and Haggard, P. (2004). Free will and free won't. *Am. Sci.* 92(4), 358-364.
Pfeifer, R. and Scheier, C. (1999). *Understanding Intelligence*. Cambridge, MA: MIT Press, Chs 2 & 3.
Searle (1990). Artificial intelligence: a debate. *Sci. Am.* 202(1) 25-31.
Shepard, R. and Metzler, J. (1971). Mental rotation of three-dimensional objects. *Science* 171, 701-703.
Sobel, C. (2001). *The Cognitive Sciences*. New York: Mayfield. Pp: 103-136.
Stufflebeam, R. (2008). Connectionism: an introduction. www.mind.ilstu.edu
Turing, A. (1950). Computing machinery and intelligence. *Mind* 59, 433-460.
Vinge, V. (2008). Signs of the singularity. *IEEE Spectrum*.
Vohs, K. and Schooler, J. (2008). The value of believing in free will. *Psychological Science* 19, 49-54.
Webb, B. (2002). Robots in invertebrate science. *Nature* 417, 359-363.
Zeman, A. (2002). Consciousness: a User's Guide. New Haven: Yale University Press, Ch. 2.

Assignments

Essays	Date Assigned	Time & Date Due	Points
1. Reduction of common-sense psychology?	22 Sept	9 a.m. 1 Oct	10
2. Artificial intelligence.	29 Oct	9 a.m. 5 Nov	10
3. The memory-prediction framework.	17 Nov	9 a.m. 24 Nov	15
4. Paper in lieu of a final exam.	8 Dec	5 p.m. 17 Dec	10
Quantitative problem sets			
1. Turing machine computations	1 Oct	9 a.m. 13 Oct	15
2. Connectionism: delta rule.	15 Oct	9 a.m. 29 Oct	15
3. Genetic & evolutionary algorithms.	5 Nov	9 a.m. 17 Nov	15
Attendance and participation			10
		Total	100

Attendance policy: Roll will be taken at every lecture. Your attendance will be used, in part, to determine your "attendance and participation" grade, which is 10% of the course. Please email me ("jolong") if you have a sanctioned religious or health-related excuse for missing a lecture. A sanctioned excuse refers to religious holidays listed by the Dean of Studies or an excuse sent to me by your Class Advisor (freshmen: that's the Dean of Freshmen). Leaving campus to catch a ride, plane, or train home for a holiday is not a sanctioned excuse.

Disability policy: Academic accommodations are available for students with disabilities who are registered with the Office of Disability and Support Services (DSS). Students in need of disability accommodations should schedule an appointment with me early in the semester to discuss any accommodations for this course that have been approved by the DSS, as indicated in your DSS accommodation letter.

Late-assignment policy: All late assignments will be penalized by a reduction of 2% (of total possible points) for each day late. If you cannot make it to class, email your assignment to me ("jolong") to establish time of submission. An extension will only be given if it is requested by your Class Advisor.

You must hand in all assignments – essays and quantitative problem sets -- to receive a passing grade in this course. Please also retain a copy of each assignment that you submit, in case either or us have any question later about whether or not you submitted a particular assignment.

This course fulfills the College's quantitative requirement.