STS 325: Minds and Machines
Time: MW 8:30-10:00
Location: CKB212
Instructor: Michael Brownstein, msb@njit.edu
Office Hours: MW 10:15-11:30 or by appointment in 312 Cullimore

Course Description

Is the mind like an extraordinarily complex machine? If so, what kind of machine is it like? This course examines the most contemporary mechanical metaphor for the mind: the computer. The idea that the mind is like a computer is the founding assumption of modern cognitive science. In trying to understand how the mind is or is not like a computer, we will take what John Haugeland calls a "mind design" approach; that is, we will try to understand what the mind is like by thinking about how it is built.

Required Texts

Haugeland, J. 1997. *Mind Design II: Philosophy, Psychology and Artificial Intelligence*. Cambridge: MIT
    Press. (*MD*)

Clark, A. 2000. *Mindware: An Introduction to the Philosophy of Cognitive Science*. New York: Oxford
    University Press USA. (*MW*)

All other readings will be posted to Moodle (M)

Grading

The scale this course uses is as follows:

A= 100%-90%	D=69%-60%
B= 89%-80%	F=59% - 0%
C=79% -70%	

Note: pluses and minuses will be given (e.g. 92% = A-) except for in final grades, which will not use minuses, as per NJIT's bizarro policies.

Requirements

Weekly writing (40%)
Students are required to post **2 questions about each reading** on the Moodle discussion board **prior to the beginning of each week** (e.g. 3 readings = 6 questions). These questions must be well-formulated. They should be detailed, clearly written, and **indicative of careful reading**.

Students are also required **to answer 1 question** posed by another student for each week. Answers are **due before the beginning of the following week** (e.g. if you are answering a question about the Week 1 reading, your answer must be on Moodle before the start of Week 2). Answers must be robust, thoughtful, clear and detailed. They should be 500-1000 words. You may answer any question you'd like, but **you may not answer a question that already has 2 responses.** Finally, you **may skip 2 weeks of questions and answers** (so you will need 8 sets of questions and 8 answers by the end of the semester).

Questions and answers must be carefully edited and proofread. When writing AND REVISING your work, keep the following advice from David Foster Wallace in mind: "If you are used to whipping off papers the night before they're due, running them quickly through the computer's Spellchecker, handing them in full of high-school errors and sentences that make no sense and having the professor accept them 'because the ideas are good' or something, please be informed that I draw no distinction between the quality of one's ideas and the quality of those ideas' verbal expression, and I will not accept sloppy, rough-draftish, or semiliterate college writing. Again, I am absolutely not kidding."

Short essays must be properly formatted and cited. IF YOU PLAGIARIZE A PAPER, YOU WILL FAIL THE COURSE. For information on NJIT's academic integrity policy, see http://www.njit.edu/academics/integrity.php

Tests (40%)
There will be **a mid-term and a final**. Each test will consist of short essay questions based upon the main readings from the syllabus. A pool of potential questions will be distributed prior to each test and all questions on the test will be taken from this pool.

Participation, Attendance, and Quality of Failure (20%)
Active and informed participation in class discussions counts for a relatively large portion of your final grade in this course. If you are afraid of speaking in public, push yourself to try. If you are terribly afraid of speaking in public, please talk with me about it privately before the course begins. Note that asking questions in class—no matter how simple or well-informed the question is—counts as "active and informed participation." So, ASK THE QUESTIONS IN YOUR HEAD, EVEN IF YOU THINK EVERYONE ELSE KNOWS THE ANSWER. (HINT: THEY DON'T.)

Regular class attendance is also expected and counts toward this portion of your grade.

Quality of failure refers to the degree to which you propose ideas and arguments which may be ultimately false or unconvincing, but which represent **genuine effort at thinking hard about the course material**. Bad experience makes good judgment. To do well in this course, you need to be willing to take risks and be willing to fail. When you take a risk and fail—by proposing a different

way to look at things, taking a stand for an unpopular view, or arguing for something unintuitive—
tell yourself, "this is how I learn."

Schedule

W1.23 – Introductions (no assigned work)

Week 1 (M1.28 & W1.30): The Reliability and Unreliability of Experience
  Sacks, "Speed" (M)
  Sacks, "What hallucination reveals about our minds" (M)
  Ramachandran, "Three clues to understanding your brain" (M)

Week 2 (M2.4 & W2.6): Metaphysics and Mind
  Clark, 1-5, 25-27, 162-170 (*MW*)
  Haugeland, "The Saga of the Modern Mind" (M)
  Kennedy, "The Cyborg in us all" (M)
  Bloom, "The Duel between Body and Soul" (M)
  Extra credit: watch *Blade Runner* and write a short (2-3 pg.) response

Week 3 (M2.11 & W2.13): Fundamentals of Mentality
  Haugeland, "What is Mind Design?" (*MD*)
  Thagard, "Cognitive Science" (M)
  Carandini, "From Circuits to Behavior: A Bridge too far?" (M)

Week 4 (M2.18 & W2.20): Intentionality
  Dennett, "True Believers: The Intentional Strategy and Why it Works" (*MD* 57-79)
  Clark, 43-61 (*MW*)

Week 5 (M2.25 & W2.27): Symbol Systems
  NO CLASS (lectures for this week are on Moodle)
  Turing, "Computing Machinery and Intelligence" (*MD*)
  Clark, 7-25, 28-33 (*MW*)
  Newell & Simon, "Computer Science as Empirical Inquiry" (*MD*)
  Christian, "Mind vs. Machine" (M)
  Watch: http://www.youtube.com/watch?v=E3keLeMwfHY

Week 6 (M3.4 & W3.6): Computational Theory of Mind
  Horst, "The Computational Theory of Mind" (sections 1&2) (M)
  Plyshyn, "What's in your Mind?" (M)

Week 7 (M3.11 & W3.13)
  Review and Test #1 (on W3.13)

Spring Break + M3.25 & W3.27: No class

Week 8 (M4.1 & W4.3): Critique of CTM
    Searle, "Minds, Brains, and Programs" (*MD*)
    Dreyfus, "From Socrates to Expert Systems: The Limits of Calculative Rationality" (M)
    Haugeland, "Understanding Natural Language" (M)

Week 9 (M4.8 & W4.10): Connectionism
    Clark, 62-83 (*MW*)
    Rumelhart, "The Architecture of Mind: A Connectionist Approach" (*MD*)
    Bechtel, "The Case for Connectionism" (M)
    Extra credit: read Fodor, J. and Plyshyn, Z. "Connectionism and Cognitive Architecture"
    (*MD*) and write a short (2-3 pg.) response adjudicating between connectionists and
    Fodor/Plyshyn

Week 10 (M4.15 & W4.17): Embodied Theory of Mind
    Haugeland, J. "Mind Embedded and Embodied" (M)
    Anderson, "Embodied Cognition: A Field Guide" (M)

Week 11 (M4.22 & W4.24): Robots and Dynamics
    Clark, 103-139 (*MW)*
    Brooks, "Intelligence without Representations" (*MD*)
    S: Van Gelder, T. "Dynamics and Cognition" (*MD*)

Week 12 (M4.29 & W5.1)
    Review

M5.6 – Test #2