Cognitive Science 170-010 & 080: Honors Introduction to Cognitive Science
T/Th: 9:30 – 10:45, McDowell, Room 112
Professor Andreasen
Department of Linguistics and Cognitive Science
42 E. Delaware Avenue
robina@udel.edu

Course Description
Cognitive science is an interdisciplinary study of mind that typically assumes that thinking is a material computational process. It includes fields such as philosophy, linguistics, computer science, psychology, biology, and anthropology. In this course, we will examine three complimentary approaches to the study of cognition. We will start with the idea that the mind is a special type of computer – namely, a formal symbol manipulator that runs on “wetware” instead of hardware. Second, we will examine the idea that cognition is best modeled in terms of artificial neural networks. Third, we will turn to cognitive neuroscience, which aims to understand cognition primarily in terms of brain processes. We will evaluate each view, in part, by examining its usefulness for understanding specific types of cognitive tasks – e.g., vision, logical reasoning, various language capacities, imitation, and consciousness – as well as cases where the mind does not function properly (ex., autism, various aphasias, etc.). We will also discuss the exciting field of artificial intelligence.

Programmatic Learning Goals for the B.S. in Cognitive Science
By the end of the Cognitive Science Major, students will...
1. Communicate scientific ideas and methods (i.e., discuss and solve scientific problems and/or provide data or arguments in support of a scientific hypothesis) clearly and effectively, both orally and in writing. (Gen Ed Goal 1)
2. Critically assess scientific research (primary source articles and/or lab reports), methods, and/or problem solving related to cognitive science, linguistics, and speech pathology. (Gen Ed Goal 2)
3. Synthesize multiple methodological or disciplinary research perspectives to analyze a scientific problem and make improvements that advance the issue, debate, or research. (Gen Ed Goal 3)

Learning Goals for CGSC 170: Introduction to Cognitive Science
By the end of this course, students will be able to...
1. Communicate, clearly and effectively, key concepts and theories that are foundational to the field of cognitive science – both orally and in writing. (Programmatic Goal 1; Gen Ed Goal 1).
2. Apply the scientific method of theory testing and analysis – i.e., related to how arguments and/or data support a scientific hypothesis or thesis (Programmatic Goal 2; Gen Ed Goal 2)
3. Integrate multiple methodological or disciplinary perspectives applied to a specific problem about cognition (Programmatic Goal 3; Gen Ed Goal 5)
4. Learn and think independently and collaboratively. (Gen Ed Goal 3)

Required Texts & Other Resources
1. Cognitive Science: An Introduction to the Study of Mind, Jay Friedenberg & Gordon Silverman: Available at the University Bookstore, Lieberman’s, DE Book Exchange, or Amazon.com.
2. Articles on SAKAI: Some articles will be available in PDF or Web format. They can be found by following the Resources link and looking in the ‘Readings’ folder. You can login to Sakai at: https://sakai.udel.edu/portal.
3. Other Resources on Sakai: Follow the resources ‘Resources’ link and you will find folders titled ‘Syllabus,’ ‘Class Schedule,’ ‘Handouts & Assignments,’ ‘Readings,’ ‘Podcasts and Videos.’ Within each folder there will be important materials for the class (ex., copy of syllabus, schedule of readings, handouts, assignments, etc.). Please check this site on a regular basis.

Exams, Expectations, and Other Logistics
1. Office Hours: Thursdays before class. The location of my office hours sometimes varies. We will either meet in the classroom or my office. Please let me know via email, if you would like to meet and we will choose a convenient location.
2. Exams: Required for successful completion of this course will be 3 in-class exams (each worth 33.333 of your final grade).
3. Homework, Attendance, and Participation: These elements are required and failure to meet them will count against your final grade. I will take attendance daily. You are allowed two absences (excused or unexcused) without penalty. Homework assignments will be announced in class and will be posted on Sakai (under the Resources link).
4. Class Schedule: A schedule of readings, handouts, assignments, and exam dates will be posted on Sakai. Please follow the resources link and look for the folder titled ‘Class Schedule’.
5. Missed Exams or Paper Deadlines: I do not allow make-up exams or late papers, unless you have cleared it with me in advance. If you miss an exam or a paper deadline because of illness or family emergency, I will expect a note from a medical professional or the appropriate administrative office.
6. **Extra Credit:** There will be **no extra credit** exams or assignments.
7. **Class Notes & Overheads:** I do not distribute my notes or overheads. If you miss a class, please get the notes from another student. If you have specific questions once you have reviewed them, I will be happy to meet with you in office hours.
8. **Cheating and Plagiarism:** These are very serious offenses and will not be tolerated. **If a student is found guilty of either, he or she will fail the course.** If you have any doubts about what constitutes cheating or plagiarism, please see the section on 'academic honesty' in the **Academic Code of Conduct:** [http://www.udel.edu/stuguide/08-09/code.html#honesty](http://www.udel.edu/stuguide/08-09/code.html#honesty).
9. **Final Grades:** I will assign final grades according to the following scale:

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<th>Grade</th>
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<tr>
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<td>B-</td>
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<td>59% &amp; below</td>
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**Topics and Readings**

**What is Cognitive Science?**
- Thagard, “Cognitive Science”
- Sakai (‘Resources’ → ‘Readings’)
- Friedenberg & Silverman, “Introduction”
- Cognitive Science, Chapter 1
- Friedenberg & Silverman, “The Psychological Approach”
- Cognitive Science, pp. 85-88
- Heil, “Psychological Behaviorism”
- Cognitive Science, Chapter 4, pp. 95-100
- Friedenberg & Silverman, “Cognitive Approach I”
- UPENN Lecture Summary, “Stages of Language Acquisition”
- Guasti, “Language Acquisition”
- Sakai (Resources → Readings)

**Mind as Computer**
- Sober, “Deductive Arguments”
- Sakai (Resources → Readings)
- Sober, “Inductive and Abductive Arguments”
- Sakai (Resources → Readings)
- Thagard, “Logic”
- Sakai (Resources → Readings)
- Friedenberg & Silverman, “Logical Reasoning”
- Cognitive Science, Chapter 8, pp. 250-253
- Smith & Kosslyn, “Theories of Deductive Reasoning”
- Sakai (Resources → Readings)
- Smith & Kosslyn, “Neurological Plausibility”
- Sakai (Resources → Readings)

**Mind as Artificial Neural Network**
- Friedenberg & Silverman, “The Network Approach: Mind as Web”
- Cognitive Science, Chapter 7
- Churchland, “Cognitive Activity in Artificial Neural Networks”
- Sakai (Resources → Readings)

**Artificial Intelligence**
- Friedenberg & Silverman, “Artificial Intelligence I: Definitional Perspective”
- Cognitive Science, Chapter 10
- Turing, “Computing Machinery and Intelligence”
- Sakai (Resources → Readings)
- Kim, “Turing Machines”
- Sakai (Resources → Readings)
- Searle, “Minds, Brains, Programs”
- Sakai (Resources → Readings)
- Ortiz, “Computer Brain Interfaces”
- Sakai (Resources → Readings)
- CBS News, “Harnessing the Power of the Brain”
- Sakai (Resources → Podcasts)

**Mind as Brain**
- Friedenberg & Silverman, “The Neuroscience Approach”
- Cognitive Science, Chapter 6, 163-181
- Cognitive Science, Chapter 4, pp. 100-111
- Friedenberg & Silverman, “The Cognitive Approach II”
- Cognitive Science, Chapter 5, pp. 125-139
- Rosenzweig, Breedlove, & Watson, “Language and Cognition”
- Sakai (Resources → Readings)
- Hickok, et al., “Sign Language in the Brain”
- Sakai (Resources → Readings)

**Autism**
- NIMH, “Autism Spectrum Disorder”
- Sakai (Resources → Readings)
- DSM IV, “Diagnostic Criteria, Autism”
- Sakai (Resources → Readings)
- Rodier, “The Early Origins of Autism”
- Sakai (Resources → Readings)
- Smith & Kosslyn, “Imitation”
- Sakai (Resources → Readings)
- Ramachandran & Oberman, “Broken Mirrors”
- Sakai (Resources → Readings)
- Gallagher & Sahavi, “False Belief Tests”
- Sakai (Resources → Readings)
- Iacoboni, et al., “The Mirror Neuron System and the Consequences of its Dysfunction”
- Sakai (Resources → Readings)
- Southgate & Hamilton, “Unbroken Mirrors”
- Sakai (Resources → Readings)
- Sakai (Resources → Readings)