

COGS 111: Introduction to Cognitive Science

Spring 2007 Syllabus

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Office: Olmstead Hall 342
Hours: 11:00-11:50/1:00-1:50 MWF
Class Time: MWF 2:00-2:50
Room: KC 125

Course Description

This course will introduce basic concepts, issues and methodologies associated with the interdisciplinary study of human cognition. Its primary goal is to pare down important concepts, such as “cognition,” “intelligence,” and “consciousness,” to render them appropriate as topics for empirical science. Insights will be appropriately drawn from several fields including biology, computer science, philosophy and psychology. This course is offered for general education credit as a three-hour non-lab science option and serves as a requirement for majors and minors in cognitive science.

Required Texts

Clark, A. (2001). *Mindware: An introduction to the philosophy of cognitive science*. Oxford: Oxford University Press.

Damasio, A. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Quill.

Kolak, D., et. al. (2006). *Cognitive Science: An Introduction to Mind and Brain*. New York: Routledge.

Assignments

Students are required to come to class prepared, having read and attempted to understand the reading assignment for the day. In addition, each student will be required to take two exams, a midterm and a comprehensive final exam, and write a five to six page paper on any topic related to the course. The due dates for all assignments are listed on the calendar below.

Grading

20% - Midterm Exam
30% - Final Exam
30% - Paper
20% - Course Participation

Exam Format

Both the midterm and final exams will involve a mixture of objective and written essay components. The objective part may consist of true/false and multiple choice questions with some additional items for matching. The written components will require short, paragraph-length answers. Students will be allotted fifty minutes for the midterm and two hours for the final exam.

Paper Requirements and Evaluation

The topic for your paper must address some theme that overlaps with course content. (If you are in doubt, ask the instructor!) You must use at least four sources from the library or from an online journal database that indexes peer-reviewed academic papers, such as *J-STOR*. Resources found in *Noesis: Philosophical Research Online* (see below) can be used as well, provided that they are full-length academic articles. However, avoid encyclopedia articles, whether in the library or online.

Your paper should be longer than five pages and no longer than six. It must be in Times New Roman, 12 point font and formatted according to the MLA style as indicated in the *MLA Handbook for Writers of Research Papers*, 6th Edition. (Copies are available in the library, bookstore and at Barnes & Noble.) Be sure to include a title. Staple the paper in the top, left corner.

All papers must be submitted in print and electronically through Turnitin.com. Necessary submission information will be posted to Acelink at the appropriate time. Late papers will be penalized accordingly.

Your paper will be evaluated according to the following characteristics, though it will not be graded according to an average based on individual assessments of each area. (In other words, I will consider the paper as a whole looking to the following characteristics for guidance.)

- *Focus* – Does the paper stick to its topic, addressing necessary details while avoiding extraneous ones?
- *Organization* – Is the paper well-organized with respect to the order and presentation of ideas? Are ideas properly subordinated throughout the paper?
- *Clarity* – Is the paper generally clear and the prose readable? Is the thesis and argument explicit?
- *Argument* – Is the paper well-reasoned on the basis of sound and cogent argument? Is evidence interpreted adequately?
- *Factuality* – Are the factual assertions advanced in the paper generally correct? Are they adequately supported by documentation as needed?

- *Use of Sources* – Are sources appropriately integrated into your paper and mixed throughout.
- *Documentation* – Is the selection and use of sources appropriate for the topic? Is the paper properly documented with citations to your sources?
- *Format* – Does the paper adhere to the formatting guidelines of the 6th edition of the MLA style manual?
- *Grammar* – Is language used according to the rules of grammar? Is it properly academic?

Course Participation

Course participation grades are not automatic. They are based on oral contributions to the collective learning experience of the class as a whole in terms of asking pertinent questions, answering questions correctly or, at least, provocatively, making insightful observations, and offering other meaningful expressions of interest in the material that help encourage learning. I begin by assuming a C for each student's course participation grade and move from there. Students should realize that *it is possible to talk a lot in class and receive a low grade for course participation*. Frequent absences are also grounds for a low participation grade.

Attendance

Because being present and attentive in class is part of (and perhaps the most important part of) the learning experience and because a serious comportment toward learning new ideas is necessary for understanding cognitive science, I have a serious attendance policy: *final grades will be dropped a part letter grade for each unexcused absence after the first*. In order for an absence to be excused, students must submit an official university excuse in writing. I will NOT accept email for this purpose. Special consideration will be given to seniors who miss class for job and graduate school interviews that must be scheduled during class time.

Electronic Technology in the Classroom (Cell Phones, Laptops, Etc.)

The use of laptops, cell phones, gaming devices and other electronic contraptions is not permitted in class. Students caught using them will be asked to leave and counted absent for the day. (You can wear a watch, if you must, but please don't sit staring at it during my lectures.)

Food in the Classroom

No eating in class.

Incompletes

Incompletes will be given only in rare circumstances and only when a previous arrangement has been made.

Academic Honesty

All work submitted in this course must be prepared by the student expressly for this course. A student who submits work that is plagiarized, bought, borrowed from the archives of a fraternity, copied from another student, etc., *will fail the course*. I fully support the University's Academic Honor Code. To avoid confusion, students should keep in mind that plagiarism occurs not only when someone copies an author word for word, but also when someone uses another's ideas without giving credit, even if the ideas are paraphrased (that is, put in your own words). Always document your sources!

Optional Crick Lectures

The University of Evansville's Programs in Cognitive Science and Psychobiology jointly sponsor an annual lecture series on topics of mutual interest to the two programs. This semester's "Crick Lectures in the Cognitive and Neural Sciences" are scheduled for February 21st and April 18th, 4:00-:500 p.m. in KC 101. Specific topics will be announced in class. Attendance is not required, but you might want to attend to enrich your own understanding of cognitive science.

Supplemental Reading / Noesis

Noesis: Philosophical Research Online is a limited area search engine dedicated to open access, academic philosophy on the Internet. It is based at UE and available online at <http://noesis.evansville.edu>. Noesis ranges topically across the profession of philosophy with overlap into areas that are pertinent to its study, including cognitive and political science. It also allows simultaneous search of two, excellent Internet encyclopedias in philosophy.

The following texts address some of the topics covered by the course. They range in difficulty from the easily-comprehensible to the exceedingly-tough. While I disagree with some of them, all are worth reading. Several were used in the preparation of this course.

Beavers, A. F. (2002). Phenomenology and artificial intelligence. In J. H. Moor and T. W. Bynum (Eds.), *Cyberphilosophy: The intersection of computing and philosophy* (66-77). Malden, MA: Blackwell Publishing.

Bennett, M. R. & Hacker, P. M. S. (2003). *Philosophical foundations of neuroscience*. Malden, MA: Blackwell Publishing.

Calvin, W. H. (1996). *How brains think: Evolving intelligence, then and now*. NY: Basic Books.

- Churchland, P. S. (1986). *Neurophilosophy: Toward a unified science of the mind/brain*. Cambridge, MA: MIT Press.
- Churchland, P. M. (1989). *A neurocomputational perspective: The nature of mind and the structure of science*. Cambridge, MA: MIT Press.
- Clark, A. (1993). *Associative engines: Connectionism, concepts and representational change*. Cambridge, MA: MIT Press.
- Clark, A. (1997). *Being there: Putting brain, body, and world together again*. Cambridge, MA: MIT Press.
- Clark, A. (2003). *Natural-Born cyborgs: Minds, technologies, and the future of human intelligence*. Oxford: Oxford University Press.
- Damasio, A. R. (1994). *Descartes' error: Emotion, reason and the human brain*. NY: Harper Collins.
- Dennett, D. C. (1987). *The intentional stance*. Cambridge, MA: MIT Press.
- Dreyfus, Hubert L. (1992). *What computers still can't do: A critique of artificial reason*. Cambridge, MA: MIT Press.
- Haugeland, J. (1985). *Artificial intelligence: The very idea*. Cambridge, MA: MIT Press.
- Haugeland, J. (Ed.). (1997). *Mind design II: Philosophy, psychology, artificial intelligence*. Cambridge, MA: MIT Press.
- Norman, D. A. (1993). *Things that make us smart: Defending human attributes in the age of the machine*. Cambridge, MA: Perseus Books.
- Pinker, S. (1997). *How the mind works*. NY: W. W. Norton and Company.

Other Courses at UE

The University of Evansville offers a wide range of courses that address themes raised in this introductory course. They include everything from detailed, low-level study of our neurophysiology and the philosophy of mind to how-to courses on writing artificial intelligence software and building robots. A majors and minor in cognitive science is also available. For information, visit <http://cogsci.evansville.edu> or see the university catalogue.

Course Calendar

1/10 *Syllabus; Monkey Business; Human and Non-Human Animals*

- 1/12 *From Epistemology to Computer Science* / Read Kolak 5-13
- 1/17 *From Introspectionism to Behaviorism* / Read Kolak 13-22
- 1/19 *Artificial Intelligence* / Read Kolak 23-29
- 1/22 *The Philosophy of Mind* / Read Kolak 29-30 & Clark 162-170
- 1/24 *Turing Machines and Human Cognition* / Read Kolak 30-43
- 1/26 *The Representational Theory of Mind* / Read Kolak 43-53
- 1/29 *Some Issues with the Representational Theory of Mind* / Read Clark 7-27
- 1/31 *Cognitive Psychology and Computer Science* / Read Kolak 55-73
- 2/2 *Physical Symbol Systems* / Read Clark 28-42
- 2/5 *Folk Psychology, Eliminativism and Instrumentalism* / Read Clark 43-61
- 2/7 *Some Basic Neuroscience* / Read Kolak 73-80
- 2/9 *Connectionism* / Read Clark 62-73
- 2/12 *Some Issues with Connectionism* / Read Clark 73-83
- 2/14 *Sensation and Vector Coding* / Read Kolak 81-91
- 2/16 *The Visual System* / Read Kolak 91-100
- 2/19 *Connectionist Models of Facial Recognition and Depth Perception*
- 2/21 *Philosophical Theories of Perception* / Read Kolak 100-110
- 2/23 *The Theory-Ladenness of Perception* / Read Kolak 112-115
- 2/26 *Perception, the Body and Virtual Reality* / Read Kolak 112-124
- 2/28 Review for Midterm Exam
- 3/2 **Midterm Exam**
- 3/12 *Memory* / Read Kolak 125-136
- 3/14 *Reasoning* / Read Kolak 136-146

- 3/16 *Knowledge* / Read Kolak 146-154
- 3/19 *Concepts, Categories, State Spaces, and the Language of Thought*
- 3/21 *Everyday Coping and Common Sense*
- 3/23 *The Nature and Limitations of Science* / Read Kolak 155-161
- 3/26 *Action* / Read Kolak 163-177
- 3/28 *Perception, Action, and the Brain* / Read Clark 84-102
- 3/30 *Robots and Artificial Life* / Read Clark 103-112
- 4/2 *Emergence, Evolution, and Emergent Materialism*
- 4/4 **Research Paper Due**
- 4/11 *Emotion and Situated Cognition* / Read Kolak 177-185
- 4/13 *Dynamic Systems Theory* / Read Clark 120-139
- 4/16 *Cognitive Technology* / Read Clark 140-161
- 4/18 *An Artificial Life Model of Emergent Communication*
- 4/20 *Language as the Ultimate Artifact* / Read Kolak 196-207
- 4/23 *Consciousness* / Read Kolak 215-223
- 4/25 *Consciousness Continued* / Read Clark 171-187
- 4/27 *Summary of Course / Conclusions*
- 4/30 Review for Final Exam
- 5/8 **Comprehensive Final Exam (2:45-4:45)**