Cognitive Studies 230

Introduction to Cognitive Science

Winter, 2002

Elveton & Galotti

The aim of this course is to provide you with an overall perspective on the radical shift in substance and methodology in the study of human cognition brought about fifty years ago by the “cognitive revolution.” We shall explore how the disciplines of artificial intelligence, computer science, linguistics, neuroscience, philosophy and psychology have shaped the contemporary discussion of the nature of the human mind, human behavior and rationality.

We shall investigate several competing paradigms concerning the underlying architecture of human cognition and its most salient overt characteristics. We shall also consider a broad range of “case studies” in human cognition, including language, vision, reasoning and memory. Finally, we will review some of the outstanding challenges and questions confronting the cognitive sciences.

Formal requirements for the course include a mid-term and a final examination and an end-of-term essay. The course format will include formal lectures and class discussion.

The required texts for the course are:

Dawson, *Understanding Cognitive Science*
Fodor, *Modularity of Mind*

Other course reading assignments will be available on closed reserve.
Reading Assignments


January 3: The Modularity Thesis and An Example: David Marr’s Computational Theory of Vision

Readings


January 8: Memory: Basic structures?

Readings

**Required:** Miller, "The Magical Number 7, Plus or Minus Two: Some Limits on our Capacity for Processing Information," Atkinson & Shiffrin, "The Control of Short-Term Memory"; Baddeley, "Working Memory" all in Sternber & Wagner, *Readings in Cognitive Psychology*.

January 10: Knowledge Representation

Readings

**Required:** Collins & Quillian, "Retrieval Time from Semantic Memory"; Abbott, Black, & Smith, "The Representation of Scripts in Memory"; both in Komatsu, *Experimenting with the Mind: Readings in Cognitive Psychology*. 
January 15: *Reasoning and Common Sense Rationality*

**Readings**

**Required:** Fodor, *The Modularity of Mind*, pp. 101-129; Cheng, Holyoak, Nisbett & Oliver, "Pragmatic Versus Syntactic Approaches to Training Deductive Reasoning" (CR)


January 17: *The Wittgensteinian Revolution and the Study of Concepts*

**Readings**


January 22: *Chomsky’s Linguistic Theory*

**Readings**


The Classical Model of Symbol Processing

January 24: Turing Machines and the Computer Model

Readings


Connectionism and the Critique of Formal Procedures

January 29: Connectionism: Background

Readings

Required: Dawson, Chapters 3 & 4.


January 31: Connectionist Simulations and Limitations

Readings

Required: Dawson, Chapter 5.

Foundations of Cognitive Science (CR). A very recent treatment of these issues can be found in Gary Marcus, *The Algebraic Mind*.

### Levels of Analysis in Cognitive Science

February 5: *Computational, Functional and Algorithmic Analysis*. **One Hour Mid-Term Exam.**

**Readings**

**Required:** Dawson, Chapters 6 & 7.


### Situated Cognition

February 7: *Cognition and Cognitive Development in Social Context*

**Readings**


February 12: *Formal vs. Everyday Thinking*

**Readings**

February 14:  *Cultural Influences on Cognition*

**Readings**


February 19:  *Ecological validity versus internal validity: A necessary conflict?*

**Readings**

**Required:** Banaji & Crowder, *The Bankruptcy of Everyday Memory* (CR) *(read this first)* then read replies by Loftus, Ceci & Brofenbrenner, Neisser (CR)

**Embodied Cognition**

February 21:  *Intelligent Robots and Artificial Life*

**Readings**


February 26:  *Dynamic System Approaches*

**Readings**


**Questions, Challenges and (possibly) Mysteries**

February 28:  *Meaning and Intentionality*

**Readings**

March 5: *Is Consciousness a Mystery?*

**Readings**

**Required:** McGinn, “Consciousness – Still Unexplained After All These Years,” and “Natural Mysteries and Biased Minds” in *The Mysterious Flame* (CR).

March 7: *Another Challenge to Simulating Common Sense Reasoning*

**Reading**