PHIL3440-Philosophical Foundations of Cognitive Science

Professor:	Dr. Dustin Stokes	
Section:	PHIL3440 Sec 001	
	Lectures M/W 9:40-10:30AM	CTIHB109
	Discussion F 9:40-10:30AM**	CTIHB109
Office:	CTIHB 427	
Office Hours:	Monday 1:00-2:30 PM /or by appointment	
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**Discussion sessions will be held every third Friday. See schedule below.

Course description

This is a course on the philosophical foundations of the field now known as cognitive science. The course will be organized around the following four areas.

PHILOSOPHICAL BACKGROUND: THE MIND AND BODY

Traditionally, philosophers have asked about the nature of mind: What *is* the mind? What kinds of thing are beliefs and perceptual experiences? Descartes framed this question by asking about the relation between the mind and our physical body. Dualists claim that the mind and body are distinct. Physicalists claim that the mind is ultimately explainable in terms of the physical. Understanding this background will help us understand the philosophical foundations of cognitive science.

MIND AS COMPUTER

With the advent of modern computing, and an important set of challenges to extant philosophical theories of mind, came functionalism. Functionalism understands mental entities in terms of their causal-functional or computational role. Thinking about the mind this way opens the door for artificial intelligence: genuine, thinking computers. We will consider the principles basic to this general category of theory, as well as some important challenges to different versions of AI and cognitive science.

MENTAL REPRESENTATION

Another important thesis for cognitive science is that the mind represents the world. If this is true, then we need a theory of mental representation—a theory that explains how cognitive states manage to be about things in the world (and thus how computational states can achieve this kind of representation). We will consider both classical and connectionist approaches to this question, both of which understand mental representation, broadly, in terms of computing.

RECENT CHALLENGES AND DEVELOPMENTS

We finish the course by considering some recent challenges to some basic assumptions of cognitive science. How can the various disciplines supposed to constitute cognitive science work together to provide a unified explanation of the mind? What are the appropriate levels for describing cognitive operations: functional, physical…? What importance, if any, should we place on the body or the environment in studying cognition?

Course materials

- *Mindware*, Andy Clark (Oxford University Press 2000)
- All remaining readings (plus all other course materials: lecture slides, notes, assignments) will be available on the course CANVAS website. The site may be accessed via: https://utah.instructure.com/courses/220350 (You will have to log in using your student id and password.)

Assignments/Requirements:

5%	**Participation**	
25%	**Short paper 1**	**DUE Fri 15 Feb** (Topics assigned 2/08)
30%	**Short paper 2**	**DUE Fri 12 Apr** (Topics assigned 4/05)
40%	**Final exam**	**Wed 1 May 8:00-10:00AM**

The short papers might also be thought of as take-home exams. You will be given a short list of questions, from which you will choose and respond to one. The questions will be made available on CANVAS, and the papers are to be submitted one week later via CANVAS (see dates above).Your responses should be concise and to the point, and should be approximately 750-1250 words. (Note: the second short paper is weighted slightly more than the first, since you will receive feedback on the first that hopefully allows you to improve on the second.)

The participation component is mostly composed of participation in discussion group sessions, held in class (every third Friday; see schedule below).

The final exam will be comprehensive and essay-style, but like the short papers, you will have choices between questions. More details later.

General:

This is a writing intensive course. All of the work/examinations will be written. Your papers will be graded not only on content, but also on grammar, writing mechanics, style, etc. The University writing centre can be found online here:
http://writingcenter.utah.edu/

I also recommend this for writing philosophy papers:
http://www.jimpryor.net/teaching/guidelines/writing.html

Plagiarism and academic dishonesty of any kind will be treated with zero tolerance. It is your responsibility to familiarize yourself with the university guidelines and policies on academic integrity, see the Student Code, section V ("Student Academic Conduct"), Part B ("Academic Misconduct"), online here:
http://www.regulations.utah.edu/academics/6-400.html

Late work/exams are allowed only with the submission of an official Medical Certificate or a letter from your registrar (or other university authority). **Unexcused late work will NOT be accepted.** No exceptions.

If you require special test-taking or note-taking accommodations, please see me.

Reading/lecture schedule:

*You are expected to have the reading completed **prior** to the lecture date listed for that readings.

**MW=Reading in Clark's *Mindware*
@=Reading available online (on course CANVAS webpage)

PHILOSOPHICAL BACKGROUND

Mon 1/07 *Introduction*
Wed 1/09 *The traditional mind/body problem*

Fri 1/11 NO CLASS

Mon 1/14 *Identity theory*
READ: Smart, 'Sensations and brain processes'-@
Wed 1/16 *Identity theory continued*
Fri 1/18 NO CLASS

Mon 1/21 HOLIDAY-NO CLASS
Wed 1/23 *The challenge from multiple realizability*
READ: Putnam 'The nature of mental states'-@
Fri 1/25 Discussion

MIND AS COMPUTER

Mon 1/28 *Computing and thinking*
READ: Turing 'Computing machinery and intelligence-@
Wed 1/30 *Functionalism*
READ: Clark, Ch. 1 'Meat Machines: Mindware as software'-MW
Heil, 'Functionalism'-@
Fri 2/01 NO CLASS

Mon 2/04 *Functionalism and artificial intelligence*
READ: Haugeland, 'Semantic engines…'-@
Wed 2/06 *AI continued*
READ: Haugeland, 'What is mind design?'-@
Fri 2/08 NO CLASS

Mon 2/11 *Challenges to AI*
READ: Clark, Ch. 2 'Symbol Systems'-MW
Searle, 'Minds, Brains, and Programs'-@
Wed 2/13 *Challenges to AI cont.*
Fri 2/15 Discussion

Mon 2/18 HOLIDAY-NO CLASS
Wed 2/20 *Challenges to AI cont.*
Fri 2/22 NO CLASS

Mon 2/25 *Changes to AI: Connectionism*
READ: Clark, Ch. 4 'Connectionism'-MW
Wed 2/27 *Changes to AI cont.*
Fri 3/01 NO CLASS

MENTAL REPRESENTATION
Mon 3/04 *The problem of intentionality*
READ: Crane, Ch. 1 from *The Mechanical Mind*-@
Wed 3/06 *Intentionality continued*
Fri 3/08 Discussion

Mon 3/11 SPRING BREAK-NO CLASS
Wed 3/13 SPRING BREAK-NO CLASS

Fri 3/15 SPRING BREAK-NO CLASS

Mon 3/18 *The language of thought*
READ: Heil, 'The representational theory of mind'-@
Wed 3/20 *The language of thought cont.*
READ: Fodor, 'The language of thought: First approximations'-@
Fri 3/22 NO CLASS

Mon 3/25 *The connectionist alternative (again)*
READ: Bermudez, from 'Information processing in neural networks'-@
Wed 3/27 *Classical vs. connectionist models*
READ: Aizawa, 'Cognitive architecture: The structure of cognitive representations'-@
Fri 3/29 Discussion

Mon 4/01 *Classical vs. connectionist models cont.*
RECENT CHALLENGES AND DEVELOPMENTS
Wed 4/03 *Contemporary cognitive science and integration*
READ: Bermudez,, 'Cognitive science and the integration challenge'-@
Fri 4/05 NO CLASS

Mon 4/08 *The integration challenge continued*
Wed 4/10 *The body and the environment*
READ: Dreyfus, 'The role of the body in intelligent behavior'-@
Fri 4/12 NO CLASS

Mon 4/15 *Cognition and levels of description*
READ: Marr, from *Vision*-@
Wed 4/17 *The body, environment, and levels of description*
READ: Clark, Ch. 5 'Perception, action, and the brain'-MW
Fri 4/19 Discussion

Mon 4/22 *Robotics and artificial life*
READ: Clark, Ch. 6 'Robots and artificial life'-MW
Wed 4/24 *Cognitive science today*

Resources:

Many of the readings will be primary sources. Needless to say, much of this material will be challenging. You might find some of the following resources helpful.

-For introductory texts (in addition to the Clark text assigned for the course) try Kim, J., *Philosophy of Mind*, Second Edition (Westview Press: 2005) or Heil, J., *Philosophy of Mind: A Contemporary Introduction* (Routledge: 2004).

-For general philosophy resources, I suggest both *The Cambridge Dictionary of Philosophy*, (1999) ed. Audi, R. and *The Oxford Dictionary of Philosophy*, (1994) ed. Blackburn, S. Online, try the Stanford Encyclopedia of Philosophy at http://plato.stanford.edu/