Philosophy and Cognitive Science (PHIL321g)  
Bates College, Winter 2013  
Professor William Seeley  
Office Hours: T/Th 11-1, 315 Hedge  
wseeley@bates.edu / http://abacus.bates.edu/~wseeley

Course Description:  
Cognitive science is an interdisciplinary field in which theories and methods from psychology, computer science,  
neuroscience, linguistics, and philosophy are used to study cognitive phenomena, e.g. thinking, rationality,  
perception, language learning, and language comprehension. In its broadest form cognitive science is the study of  
how organisms acquire, represent, manipulate, and use information. In this context the goal of cognitive science  
is to provide an account of the sorts of mental computations that underlie intelligent performance. As a result what  
philosophers call the computational theory of mind has been central to this project. In this course we will evaluate  
the computational model of mind and discuss its application to three areas of cognitive research: artificial  
telligence, language, and vision. Along the way we will discuss some challenges to this traditional model for  
cognitive science and evaluate the relationship between the computational model of mind and new research in  
cognitive neuroscience.

Course Goals:  
The goals of this course are threefold: first, to introduce students to the computational theory of mind and  
evaluate the role philosophers play in the interdisciplinary study cognitive science; second, to introduce students  
to interdisciplinary research methods in cognitive science through the study of computational models of vision,  
artificial intelligence, and language comprehension; third, to evaluate some of the philosophical issues concerning  
the nature of mind, consciousness, and rationality that emerge within cognitive science.

Requirements:  
- One 3 page (750-900 word) analysis paper as outlined on the syllabus. (15%)  
- One 6 page (1800 word) mid-term paper on an assigned topic synthesizing the material covered in the first  
half of the semester. You will be given a choice between two paper topics. This paper will be due the day  
before the beginning of the mid-term break. (25%)  
- A 12 page final paper on a topic of your choosing. All students must clear final paper topics with me one  
month before the last day of classes. The final paper is due at the end of the reading day before the spring  
exam week. (40%)  
- Experimental philosophy exercises (10%).  
- Class participation in the form of 10 short in-class reading quizzes is mandatory (10%). In addition poor  
attendance will have an effect on your grade, lowering it one +/- letter grade point.

Texts:  
- Electronic resources and pdf files on *(LYCEUM)*
Schedule of Readings:

**Topic 1: The Computational Theory of Mind**

Marr   The Philosophy and the Approach *(LYCEUM)*
Haugeland What Is Mind Design *(LYCEUM)*

**Topic 2: Artificial Intelligence: GOFAI and Connectionist Models**

Rumelhart The Architecture of Mind: A Connectionist Approach *(LYCEUM)*
Smolensky Connectionist Modeling *(LYCEUM)*
The Mind Project Connectionist Modeling *(LYCEUM)*
Fodor & Pylyshyn Connectionism and Cognitive Architecture: A Critical Analysis *(LYCEUM)*
Ramsey, Stich & Garon Connectionism, Eliminativism, and the Future of Folk Psychology *(LYCEUM)*
Clark The Presence of a Symbol *(LYCEUM)*

**Topic 3: Language, Memory, & Concepts**

Medin, Ross, & Markman Memory Systems and Knowledge *(LYCEUM)*
Prinz *Furnishing the Mind* *(LYCEUM)*
Desiderata on a Theory of Concepts
Traditional Philosophical Accounts
Similarity-Based Accounts
Murphy *The Big Book of Concepts* *(LYCEUM)*
Chapter 2: Typicality and the Classical View of Categories
Chapter 3: Theories
Bloom *How Children Learn the Meanings of Words* (excerpts) *(MW)*
Concepts and Categories
Naming and Representation
* Word learning and Theory of Mind

**Topic 4: Perception**

Marr A Representational Framework for Vision *(LYCEUM)*
Palmer Theoretical Approaches to Vision *(LYCEUM)*
Goodale & Milner Sight Unseen *(SUGM)*
Pessoa et al Neuroimaging Studies of Attention *(LYCEUM)*
Hayhoe and Ballard Eye Movements in natural Vision *(LYCEUM)*
Carroll and Seeley Movies as Attentional Engines *(LYCEUM)*
Kilner More Than One Pathway to Action Understanding *(LYCEUM)*
Pessoa & Adolphs Emotion Processing and the Amygdala *(LYCEUM)*
Kovisto & Revonsuo How Meaning Shapes Seeing *(LYCEUM)*
Tarr & Bulthoff Object Recognition in Man, Monkey, and Machine *(LYCEUM)*
Palmer Perceiving Function and Category *(LYCEUM)*
Bonnar et al Understanding Dali’s… *(LYCEUM)*
Schyns & Olivia Dr. Angry and Mr. Smile *(LYCEUM)*
Schyns A Diagnostic Recognition Framework for Object Recognition *(LYCEUM)*

**Topic 5: Minds, Images, and Cognitive Neuroscience**

Kosslyn Mental Imagery *(LYCEUM)*
Pylyshyn Return of the Mental Image: Are There Really Pictures in the Head? *(LYCEUM)*
Kosslyn If neuroimaging is the answer what is the question *(LYCEUM)*
Kosslyn et al The role of area 17 in visual mental imagery *(LYCEUM)*
* Anderson Arguments Concerning Representations for Mental Imagery *(LYCEUM)*

**Topic 6: Dynamics: Another Challenge to the Computational Theory of Mind**

Brooks Intelligence without Representation *(LYCEUM)*
Clark *Being There* (excerpts) *(LYCEUM)*
Thelen & Smith The Nature of Development: A Dynamic Approach *(LYCEUM)*
Some Miscellaneous Notes and Guidelines:
The reading list for this class is arranged in topics as opposed to individual sessions. You can find a detailed bibliography of the readings below. I will announce the particular readings for each class as we go along. This will allow us some flexibility in discussion so that we can spend more time on issues of interest to the class. I will occasionally upload supplementary materials to LYCEUM for students interested in pursuing particular issues beyond class discussion. I also reserve the right to make changes to the syllabus which reflect our class interests.

Analysis papers are designed to give students a chance to stretch their legs a bit with the material and give me a chance to assess your understanding of the material. These papers should offer a philosophical defense of your take on the issue at hand. But this does not mean that they are a free forum for opinions. Rather, your evaluation should be based on the logic grounding the arguments in the debate. Make sure that your papers set out the philosophical issues germane to the question and that your responses relative virtues and shortcomings of theoretical positions discussed in class.

Finally, moral behavior is the grounds for, and the framework of, a healthy society. In this regard it is each of our responsibility as an individual within the community of our classroom to act responsibly. This includes following the rules and guidelines set out by the College for academic behavior. Plagiarism is a serious matter. It goes without saying that each of you is expected to do his or her own work and to cite EVERY text that is used to prepare a paper for this class. In general philosophy papers are NOT research papers. Your response papers should not involve any outside research and you should be able to manage your final papers using only material from the syllabus, assigned supplemental readings, and class discussion. As a general rule, I ask that you not use the internet for your research except as assigned in class.
ASSIGNMENTS:

**First Paper** – Please write a 3 page (900 word) paper on one of the following topics. Your paper should be double-spaced in 12 point font with 1” margins. The purpose of this assignment is to give you a chance to stretch your philosophical legs, provide you with some feedback about the expectations of the class, and to evaluate your understanding of the course material.

- **Paper Topic (1a):**
- **Paper Topic (1b):**

  **Due Date:** 02/05/13 @ 5pm

**Second Paper** - Write a 6 page paper (1800 words) on one of two topics to be announced on the distribution date for the midterm. Your paper should be double-spaced in 12 point font with 1” margins. The purpose of this paper is twofold: a) to evaluate a standard argument in the literature; and b) to demonstrate that you can synthesize the material covered in the 1st half of the semester into a coherent position. Make sure to hand in an electronic copy in the 2nd Paper Dropbox on LYCEUM and a hard copy in the mailbox on my office door - 315 Hedge

- **Paper Topic (2a):**
- **Paper Topic (2b):**

  **Due Date:**

**Third Paper** – Write a 12 page paper (3600 words) on a topic of your choice

  **Due Date:**

**Experimental Philosophy and Cognitive Science Exercises**

Cognitive science and experimental methods have increasingly more important in areas of philosophy like epistemology, philosophy of mind, and ethics in recent years. In early March I will set up a series of exercises to introduce students to the fundamentals of experimental design and data collection and this new approach to philosophical analysis (which should be old hat to some of you). These exercises will be available in the computer lab in Hedge for you to access and work through.
Philosophy and Cognitive Science: syllabus

Bibliography:

**Topic 1: The Computational Theory of Mind (CTM)**

  * Supplemental: 

**Topic 2: Challenges to CTM: Connectionist Models**

  * Supplemental: 

**Topic 3: Language, Memory, and Concepts**

  * Supplemental: 

**Topic 4: Perception**
Philosophy and Cognitive Science: syllabus


**Topic 5: Minds, Images, and Cognitive Neuroscience (DROPPED)**

- Stephen Kosslyn, "If Neuroimaging is the Answer, What Is the Question?" *Philosophical Transactions of the Royal Society, London B*, 354, 1283-1294.

**Topic 6: Challenges to CTM: Dynamics and Embodied Cognition**

<table>
<thead>
<tr>
<th>Date</th>
<th>Readings</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>01/08</td>
<td>Introduction: what is cognitive science</td>
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<tr>
<td>01/10</td>
<td>Marr, The philosophy and the approach: 3-31. <em>(LYCEUM)</em></td>
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<td>01/15</td>
<td>Haugeland, What is mind design, pp. 1-28. <em>(LYCEUM)</em></td>
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<td>01/17</td>
<td>Rumelhart, The architecture of mind: 205-209. <em>(LYCEUM)</em></td>
<td>Smolensky, Connectionist modeling, pp. 233-250. <em>(LYCEUM)</em></td>
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<td></td>
<td>The Mind Project: Connectionist Modeling (web resource) <em>(LYCEUM)</em></td>
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<td>Smolensky, Connectionist modeling, pp. 233-250. <em>(LYCEUM)</em></td>
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<tr>
<td>01/22</td>
<td>Fodor &amp; Pylyshyn, Connectionism and cognitive architecture <em>(LYCEUM)</em></td>
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<td>01/24</td>
<td>Ramsey, Stich, &amp; Garon, Connectionism, eliminativism, and… <em>(LYCEUM)</em></td>
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<td>01/29</td>
<td>Clark, The presence of a symbol, pp. 377-394 <em>(LYCEUM)</em></td>
<td>Topics 1 distributed</td>
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<td>01/31</td>
<td>Medin et al, Memory Systems and Knowledge, pp. 174-207 <em>(LYCEUM)</em></td>
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<td>02/05</td>
<td>Prinz, &quot;Traditional philosophical accounts,&quot; pp. 25-49. <em>(LYCEUM)</em></td>
<td>Murphy, &quot;Typicality and the classical view of concepts,&quot; pp. 1-40. <em>(LYCEUM)</em></td>
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<td>02/07</td>
<td>Murphy, &quot;Theories,&quot; pp. 41-65. <em>(LYCEUM)</em></td>
<td>Prinz, &quot;Similarity based accounts,&quot; pp. 51-74. <em>(LYCEUM)</em></td>
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<td>Analysis 1 due:</td>
<td>February 8 @ 5pm</td>
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<td>02/14</td>
<td>Bloom, Naming representations: 171-190. <em>(MW)</em></td>
<td></td>
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<td>02/16-24</td>
<td>Winter Break!!!!!!!!!!!!</td>
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<tr>
<td>02/26</td>
<td>Marr, A representational framework for vision: 31-38. <em>(LYCEUM)</em></td>
<td>Palmer, Theoretical approaches to vision: 70 - 92 <em>(LYCEUM)</em></td>
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<td>02/28</td>
<td>Goodale &amp; Milner, <em>Sight Unseen</em>: 1-38. <em>(SUGM)</em></td>
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<tr>
<td>03/07</td>
<td>Goodale &amp; Milner, <em>Sight Unseen</em>: 73-128. <em>(SUGM)</em></td>
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<td>03/12</td>
<td>Pessoa et al, Neuroimaging studies of attention: 3990-3998. <em>(LYCEUM)</em></td>
<td>Hayhoe &amp; Ballard, Eye movements in natural behavior: 188-194. <em>(LYCEUM)</em></td>
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<td>Caroll &amp; Seeley, Movies as attentional engines: 53-75. <em>(LYCEUM)</em></td>
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<td>03/14</td>
<td>Kilner, More than one pathway: 352-357. <em>(LYCEUM)</em></td>
<td>Pessoa &amp; Adolphs, Emotion and the amygdala: 773-783. <em>(LYCEUM)</em></td>
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<td>Koivisto &amp; Revonsuo, How meaning shapes seeing: 845-849. <em>(LYCEUM)</em></td>
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<td>03/19</td>
<td>Tarr &amp; Bulthoff, Image-based recognition <em>(LYCEUM)</em></td>
<td>Bonnar et al, Understanding Dali's…: 683–691. <em>(LYCEUM)</em></td>
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<td>03/21</td>
<td>Schyns &amp; Olivia, Dr. Angry &amp; Mr. Smile: <em>(LYCEUM)</em></td>
<td>Schyns, Diagnostic recognition: <em>(LYCEUM)</em></td>
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<td>03/26</td>
<td>Brooks, Intelligence without representation: 395-420. <em>(LYCEUM)</em></td>
<td>Clark, <em>Being There</em>: 1-70. <em>(LYCEUM)</em></td>
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<td>03/28</td>
<td>NO CLASS</td>
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<td>04/02</td>
<td>Thelen &amp; Smith, <em>A Dynamic Systems Approach</em>: 3-125. <em>(LYCEUM)</em></td>
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<td>04/04</td>
<td>Thelen &amp; Smith, <em>A Dynamic Systems Approach</em>: 3-125. <em>(LYCEUM)</em></td>
<td>Final Paper Due!</td>
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Philosophy and Cognitive Science: syllabus

Resource Page:

The Mind Project:
http://www.mind.iistu.edu/

A set of teaching modules and exercises on critical aspects of philosophy of mind, artificial intelligence, and cognitive science.