Psy 803 (Spring 2008)
Higher Order Cognitive Processes

Meetings: Wednesday 9:10 – 12:00 pm, Room 64 Psychology Building

Professor: Dr. Timothy J. Pleskac, 282A Psychology Building

Telephone: 517 353-8918 Email: pleskact@msu.edu.

Office hours: TBA/Open Office/By appointment

Required Text:

Course Packet: A course packet, consisting of about 40 articles/chapters, is available for photocopying or online (most will be online)

Course Description. This course is a survey of psychological and formal study of human cognition, focusing on methods of the field and their application. We will focus on thinking and reasoning (as opposed to more basic processes like perception and attention). What that means is that we will study thinking from the point of how information is stored and understood to the point where you decide what house to buy, what chess piece to move or what sentence to utter.

Here are some questions we will consider:
• What is similarity and how do people use similarity in their everyday decisions and judgments?
• How do humans discriminate between and classify objects such as letters or animals?
• What is rationality?
• How do people form predictions, like predicting whether the Spartans will win the NCAA Basketball championship?
• How do individuals use cognitive processes like learning and memory to make judgments and decisions?
• If an organism or some system of artificial intelligence desires to move to a new goal state, how does it solve the problem?

A common theme in the class will be the use of formal (computational and mathematical) cognitive models to address these questions. This is important because formal cognitive models are appearing in all fields of cognition at a rapidly increasing rate, ranging from perception to memory to problem solving and decision-making. Over 80% of the articles appearing in major theoretical journals of cognitive science contain cognitive models (e.g., Cognition, Cognitive Psychology, Cognitive Science, Neural Networks, Psychological Review, Psychonomic Bulletin and Review). They are also appearing in other more applied journal (e.g., Human Factors, Psychological Assessment). Therefore, it is important for any student seeking to understand and appreciate topics in cognitive science to become comfortable with the ideas of formal cognitive models. This course will do that.

Some goals:
1.) Increase your understanding of cognitive psychology, particularly in terms of thinking and reasoning.
2.) Provide you with enough knowledge of cognitive psychology and its methodology so that you can apply principles and methodology to understand cognition across a wide range of tasks.
3.) I would like you to gain a fuller appreciation of formal cognitive models.
I don’t intend to make all of you cognitive modelers, not even cognitive psychologists, but I would like to make you aware of the importance of understanding how we think.

Prerequisites. In day to day activities, I will assume that you have a background equivalent to

1. Mastery of the content of the "psychology as a natural science" or "brain, behavior, and cognition" portion of an introductory psychology course,
2. Mastery of the content of an undergraduate statistics and experimental design course, and
3. Comfort with advanced topics in algebra and basic principles of probability theory.
   a. If you feel uncomfortable with these topics and wish to take the course please see me.
4. Either an undergraduate course in cognitive psychology or serious experience with cognitive issues in another discipline, such as neuroscience, animal behavior and cognition, artificial intelligence, linguistics, philosophy of mind, cultural anthropology, behavioral accounting, neuropsychological rehabilitation after brain injury, English as a second language, or education.

If you do not have this particular necessary background, I recommend that you drop the course, acquire the prerequisite background, and take the course another time. I like to have a wide range of backgrounds among the students. However, a student who has an otherwise interesting background but no understanding of how experimental psychology is done or what the basic concepts of cognition are like will not be able to apply his or her background in an effective way and will always be trying to catch up on the fundamentals that I’m taking for granted.

Evaluation / Grading

- **Exams (50%)**
  - There will be 2 exams. Exams will be in the form of short answer and essay format and cumulative.
- **Quizzes (30%)**
  - At the beginning of each class, there may be a “pop” quiz. I expect there will be 9 or 10 quizzes of this nature. The quiz will be 3 or 4 short answer questions based on last week’s class, the readings for the current class, as well as past readings and classes. At the end of the semester, I will drop the lowest quiz score.
- **Class Participation (20%)**
  - Everybody will be expected to come to class having read the relevant research articles and being prepared to participate in class. Students are expected to participate energetically in all class activities. Don’t sit there like a lump – it’s boring! Reading assignments are listed in the course schedule below. Complete each reading assignment before the date for which it is listed. It is absolutely imperative that you keep current in your reading (better yet, keep ahead – read early, read often).

Make-up exam/quiz policy: I give make-up exams only for University sanctioned reasons. Please consult the University Student handbook. Notes from doctors and funeral homes are required when applicable (these are easily obtainable if your excuse is legitimate). No make-ups will be given for quizzes and in class assignments.

Note: I reserve the right to change the grading system in any way (add, delete, or change assignments, quizzes, and exams).

Note to Disabled Students: Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

Academic Misconduct: Honesty is a fundamental precept in all academic activities and those privileged to be members of a university community have a special obligation to observe the highest standards of honesty and a right to expect the same standards of others. Academic misconduct in any form is inimical to the purposes and
functions of the university and therefore is unacceptable and rigorously proscribed. If you have questions about what constitutes academic misconduct, contact me.
<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>09-Jan-2008</td>
<td>Intro</td>
<td>Chapt. 1 and 2 Newell, 1973</td>
</tr>
<tr>
<td>2</td>
<td>16-Jan-2008</td>
<td>Generalization &amp; Similarity</td>
<td>Shepard, 1987 Tversky, 1979 Medin et al., 1993</td>
</tr>
<tr>
<td>4</td>
<td>30-Jan-2008</td>
<td>More on Knowledge</td>
<td>Ch 8 Steyvers &amp; Tennenbaum, 2005 Jacoby et al., 1998 Knowlton &amp; Squire (1993)</td>
</tr>
<tr>
<td>6</td>
<td>13-Feb-2008</td>
<td>Inference</td>
<td>Gigerenzer &amp; Goldstein, 1995 Goldstein &amp; Gigerenzer, 2002 Griffiths &amp; Tennenbaum</td>
</tr>
<tr>
<td>7</td>
<td>20-Feb-2008</td>
<td>Exam 1</td>
<td></td>
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<tr>
<td></td>
<td>05-Mar-2008</td>
<td>SPRING BREAK!</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>09-Apr-2008</td>
<td>Applications 1</td>
<td>Busemeyer &amp; Stout, 2002 Wallsten, Pleskac, &amp; Lejuez, 2005 Yechiam et al., 2005</td>
</tr>
<tr>
<td>14</td>
<td>16-Apr-2008</td>
<td>Applications 2</td>
<td>Anderson Treat et al., 2001 Viken et al., 2002</td>
</tr>
<tr>
<td>15</td>
<td>23-Apr-2008</td>
<td>Exam 2</td>
<td></td>
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Introduction

Recommended Readings

Generalization & Similarity

Concepts and Categories

More on Knowledge

Judgment

Inference
Rationality

Cognitive models of judgment and inference

Decision Making

Cognitive models of decision making

Problem Solving

Applied Cognitive Science


Anderson Paper