

# MIND, BRAIN, & INTELLIGENCE (PSYC 4305)

## SPRING 2010

---

**Time:** Tuesdays & Thursdays, 9:40 am - 11:05 am

**Place:** Psychology Bldg 362

**Instructor:** Andrew Olney

**Email:** aolney@memphis.edu

**Office:** FedEx Institute of Technology, Room 408

**Office Hours:** Monday 3:00 pm - 4:00 pm

**Phone:** 678-5008

**Web:** andrewmolney.name

---

### Description

What can cognitive psychology tell us about how people learn? This is the core question that we will explore this semester. By studying mind, brain, and intelligence from the standpoint of learning, you will better understand your own learning abilities – and maybe even enhance them! In the process, we will discuss major areas of cognitive psychology and cognitive science, including:

- Memory
- Knowledge representation
- Expertise
- Learning
- Development
- Neurological basis of learning
- Learning environments
- Teaching
- Learning technology
- Metacognition
- Emotions and learning

### Objectives

- Understand the cognitive, neurological, and social basis of learning
- Study applications of cognitive principles for enhancing learning
- Independently apply this research to an analysis of learning

### Methods and Activities

- Reading assignments completed before class
- Reading response submitted to the website the day before class

- Class presentations and discussions
- Self-directed project/paper

## Materials

The primary readings will come from book chapters and journal articles listed in the course schedule below. Readings will be distributed on UMDrive ([https://umdrive.memphis.edu/aolney/internal/mbi\\_readings.zip](https://umdrive.memphis.edu/aolney/internal/mbi_readings.zip)). The main text for the course is:

Bransford, J., Brown, A., Cocking, R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

and is available in pdf in the zip file above (HPL.pdf) and is also freely available in html here:

[http://www.nap.edu/catalog.php?record\\_id=9853](http://www.nap.edu/catalog.php?record_id=9853)

Page ranges are listed in the course schedule for both honors and non-honors students, e.g. (1-14{28}) means non-honors should read pages 1-14 and honors should read 1-28.

## Grading

**Research Paper/Project (50%)** This is a way for you to both demonstrate your understanding of the course material and connect this course to your own research interests. This paper should be of value to you. You will post a brief description about the direction you are taking this assignment on the website. Everyone should read and review each other's postings, offering comments and suggestions. An oral version will be presented in the last class, and the final written version will be due at 5PM ON MAY 4TH. NO CREDIT WILL BE GIVEN FOR LATE WORK.

You may want to think of ways you can use this project to further your own work. For instance, a review of the literature may be the start of a publishable paper. You can choose from the following options, or negotiate an alternative. The key is linking it to the course content. Papers should be 10 pages (20 for Honors), double spaced, 12pt font, 1 inch margins, with references in APA format (I recommend you try Zotero for your references). Please submit papers in PDF format (PDFCreator is a free program for Windows) by email. You will also be expected to give a brief 5-minute description of your paper in that last class (no slides are required).

**Position paper** Drawing on the readings and class discussions, a position paper/essay on some aspect of thinking, learning, or teaching, or the relationship among thinking, learning and teaching. Guiding question: What ideas encountered in the course (readings and class discussions) have been influential, provocative, annoying, and/or illuminating for considering thinking, learning and/or teaching or the relationship among them? For this position paper, you will want to read some articles beyond the weekly readings.

**Literature review** A critical, theoretically interesting, review of the literature on a selected topic arising from the course and connected to the themes in the course. You will need to read beyond the weekly readings.

**Project papers** A research paper on a topic of your interest: To be negotiated.

**Response to Readings (50%)** Your response will be a blog entry on the class website ([mbi-spring-2010.blogspot.com](http://mbi-spring-2010.blogspot.com))

BY NOON THE DAY BEFORE CLASS that makes text-to-text, text-to-self, or text-to-world connections and discusses your opinions of these ideas. Each of the readings should be covered to some extent, but the readings can be given different weights in your entry. For instance, you can choose to expand on one reading over the others as long as you deal with all the readings in some way. You can pose a question, e.g.

"I found Millers theory of memory confusing. What is a bit? Is it just a mathematical idea, or is it something we can easily see in the world around us? For example, if I..." (a brief paragraph)

or you can elaborate on the reading, e.g.

"I'm not sure I agree with Millers theory regarding chunking. It seems to me that there must be some limit to the number of chunks at some point. For example..." (a brief paragraph)

"I find Millers chunking idea interesting. It actually relates directly to the way I perceive music. For example..." (a brief paragraph)

“If Millers theory of chunking were true, imagine what would happen to someone if their chunking abilities were destroyed through brain damage. I imagine this might...” (a brief paragraph)

**In addition, each paper will have one “lead student” who will prepare a presentation** summarizing both the reading and all the comments on the blog for the rest of the class. The presentation will take place at the beginning of the class and serve as the jumping off point for class discussion. Students will bid before the second class for the days on which they want to present at this website (<http://www.doodle.com/pcr86uxw24yxwbyh>). Click on one day only.

## Course Format

The format will be a blend of class discussion based on the assigned readings, presentations, and the occasional computer-based lab class. Student participation in class discussion and student preparation of questions for class discussion are key features of the format.

## Attendance

Since class participation is a significant portion of your grade, tardiness and missing classes will negatively impact your grade.

## Make-up Policy

Work is expected to be turned in on time unless arrangements have been made prior to the due date. No credit will be given for late work. Please plan ahead and arrange to be present for all classes (listed on course schedule, attached). Extensions are given only under extreme circumstances and with prior permission of instructor.

## Course Announcements

Course announcements as well as consultation with the instructor may occur via e-mail messages. Each student must maintain an e-mail account and is responsible for checking for course messages daily. Students are also responsible for notifying the instructor if their e-mail address changes during the term. The University of Memphis offers free e-mail services to students. Students without an e-mail account can bring their university ID cards, swipe them, and set up an account at the Smith or McWherter computer labs or students can bring their cards to the information technology helpdesk, room 124 in Administration Building for assistance.

## Cell Phones and Electronic Devices

Please turn off your cell phone before class begins. Any device that produces a noise, e.g. a ringtone, should be silenced before class. Any student making or receiving calls during class will be asked to leave for the duration of the call.

## Getting Help

If you have any difficulties during the course, let me know immediately. See me during office hours or contact me by email. It is important to notify me as soon as possible if you think you are losing track. Keep in mind: not asking questions is always worse than asking questions you think are silly (instead, often those questions turn out to be challenging!).

## Office Hours

Office hours are the perfect opportunity to discuss teaching and research issues. Do you want to have more information on a certain topic? Do you have difficulties finding a research question or writing a paper? Do you feel uncomfortable about assignments? Are you looking for work in a research lab? Do you have suggestions or comments? See me during office hours or send me an email.

## Special Accommodations for Disabilities

Reasonable and appropriate modifications will be provided to students with disabilities who present a memo from Student Disabilities Services (110 Wilder Tower; phone: 678-2880). Students must take the following actions to obtain disability accommodations and services at The University of Memphis:

- Register with the Student Disability Services Office and provide the Office with appropriate qualifying medical or psycho-educational documentation that establishes the existence of a qualifying disability and provides a rationale for reasonable accommodation, if applicable.
- Make their disability related needs and specific requests known in a timely manner to the appropriate people, such as their Student Disability Services Coordinator, their professors or other relevant staff ; and
- Follow the established procedures of the University and the Student Disability Services Office for acquiring needed services, accommodations and adjustments.

The University is not responsible for providing services or making academic accommodations or adjustments until the above conditions have been met. Disability accommodations are not retroactive but go into effect at the point these conditions have been met. For more information see <http://saweb.memphis.edu/sds/> and <http://policies.memphis.edu/UM1480.htm>

## Eating, Drinking, and Smoking

Eating and drinking are allowed in class as long as the noise and smell are not disruptive to other students. Decisions regarding food will be made by the instructor on a case-by-case basis. Smoking is not permitted at any time indoors, according to Tennessee law.

## Academic Integrity and Student Conduct

Plagiarism or cheating may result in your case being referred to the Academic Discipline Committee that addresses academic misconduct. This decision is up to the discretion of the instructor. Students are expected at all times to behave in accordance with the American Psychological Association Code of Ethics. Expectations for academic integrity and student conduct are described in detail on the website of the Office of Student Judicial and Ethical Affairs (<http://saweb.memphis.edu/judicialaffairs>). Please take a look, in particular, at the sections about “Academic Dishonesty,” “Student Code of Conduct and Responsibilities,” and “Disruptive Behaviors.” I will expect students to be aware of these guidelines and to conduct themselves accordingly. I take academic honesty extremely seriously. I will not tolerate any form of plagiarism, cheating or other cases of academic dishonesty and am obligated to notify the chair of the department and take serious actions through university channels in those circumstances. For instance, whenever your research papers contain other researcher’s ideas, make sure you reference them in the appropriate format. Keep in mind that sophisticated computer technologies are able to detect plagiarism from articles, the Internet and/or student essays. In sum: Be honest

## Conflict Resolution

If you have a conflict with the instructor or another student in the classroom, please see the instructor after class or during office hours. The classroom is not the appropriate place to pursue personal differences or disagreements.

## Visitors in the Classroom

Visitors to the class will be accommodated so long as they are not disruptive and do not detract from the instruction of enrolled students. Decisions regarding visitors will be made by the instructor on a case-by-case and class-by-class basis.

## Diversity in the Classroom

Diversity means the fair representation of all groups of individuals, the inclusion of minority perspectives and voices, and the appreciation of different cultural and socioeconomic group practices. We aspire to foster and maintain an

atmosphere that is free from discrimination, harassment, exploitation, or intimidation. Academic courses will aim at providing opportunities for students to discuss issues of diversity including, but not limited to, ethnicity, gender, disability and sexual orientation as they can be related to course content. The University of Memphis has adopted policies prohibiting discrimination based upon race, sex, disability, or sexual orientation. In addition, the American Psychological Association has explicit policies regarding the issues of and writing about race, gender, class, sexual orientation, disability, ethnicity, and religion. You may find information on these standards in the APA Publication Manual or on the APA webpage: <http://www.apa.org/pi/oema/>.

### Course Schedule

Date	Topic	Reading Assignment
Jan 14	Introduction	Syllabus
Jan 19	Background	Learning: From Speculation to Science (1-14{28}, HPL.pdf)
Jan 21	Background	The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring (1-14, bloom_2sigma.pdf)
Jan 26	Memory	Memory metaphors in cognitive psychology (1-17,Roediger 1980 (2).pdf)
Jan 28	Memory	Computational models of working memory(1-7, Burgess & Hitch (2006).pdf); Chunking mechanisms in human learning (1-8, gobetetal2001.pdf)
Feb 02	Knowledge Representation	The psychology of mental models (1-5, Genter (2002).pdf); Mechanical reasoning by mental simulation (1-6, Hegarty (2004).pdf)
Feb 04	Knowledge Representation	Explanation and simulation in cognitive science (1-18, green_symbol.pdf)
Feb 09	Expertise	How Experts Differ from Novices (30-50, HPL.pdf)
Feb 11	Expertise	Categorization and representation of physics problems by experts and novices (1-17, chi1981.pdf), {Recent Advances in Expertise Research {1-9}, Ericsson (2005).pdf}
Feb 16	Learning	Learning and Transfer (50-66,78-79{50-79}, HPL.pdf)
Feb 18	Learning	Situated learning and education (1-7,Anderson, Reder.Pt1.pdf)
Feb 23	Development	How Children Learn (80-96,113-114 {80-114}, HPL.pdf)
Feb 25	Development	Children's learning (1-10, Siegler (2005).pdf)
Mar 02	Learning and the Brain	Mind and Brain (115-128, HPL.pdf)
Mar 04	Learning and the Brain	Vehicles (1-7, braitenberg.pdf) {1-7 and skim "Vehicles: experiments in synthetic psychology" on Google Books}; LAB DAY

## Course Schedule

Date	Topic	Reading Assignment
Mar 16	Learning Environments	The design of learning environments (132-155, HPL.pdf)
Mar 18	Learning Environments	Guided discovery in a community of learners (1-23, brown1994.pdf)
Mar 23	Teaching	Effective Teaching (156-164, 173-181, 189-90, HPL.pdf)
Mar 25	Teaching	Concept maps (1-17, concept_map.pdf)
Mar 30	Learning Technology	(207-227, 230-231 {207-231}, HPL.pdf
Apr 01	Learning Technology	Intelligent Tutoring Systems (1-31, Shute & Psootka (1996).pdf)
Apr 06	Metacognition	The role of goal orientation in self-regulated learning (451-472, Pintrich (2000).pdf)
Apr 08	Metacognition	Self-regulated learning viewed from models of information processing (1-19, Winne (2001).pdf)
Apr 13	Emotion and Learning	Emotion regulation in adulthood (1-6, JJ Gross (2001).pdf); Regulation of motivation (1-19, Woters (2003).pdf)
Apr 15	Emotion and Learning	Towards an affect sensitive AutoTutor (1-11, dmello-ieee-is07.pdf)
Apr 20	The Future	Grounded cognition (1-29, Barsalou (in press ) ARP.pdf)
Apr 22	The Future	Timing the brain (1-3, Posner (2005).pdf); Can cognitive processes be inferred from neuroimaging data (1-5, Poldrack (2006).pdf)
Apr 27	Project presentations	N/A