

Cognitive Neuroscience-W
Psychology 341K (Unique 43905)
Spring Semester 2010
TTH 12:30-2:00, SEA 2.108

Instructor:

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Course Overview:

How do brain systems and processes result in our abilities to perceive, attend, remember, use language, experience emotion, and interact with one another? How is the brain structured and organized to handle different types of information? How can we study brain function underlying psychological processes and behavior?

Cognitive Neuroscience has emerged to examine how complex psychological phenomena arise from the function of the brain. The first goal of the course is to provide students with current perspectives on how complex processes of mind may be understood using Cognitive Neuroscience techniques (e.g., fMRI, EEG, neuropsychological study of patients). Students are encouraged to ask questions and become active learners. The second goal of the course is to introduce students to the format and content of research writing and presentation in psychological science. Beginning in the third week of the course, students will complete weekly writing assignments reviewing an empirical paper and/or media coverage regarding finding in Cognitive Neuroscience. Once during the semester, student groups will also be required to present the assigned empirical and popular press articles during class. Students will complete a final term paper consisting of two parts: (1) a scientific literature review on a topic of their choice that provides an in depth analysis of a current research question in Cognitive Neuroscience, and (2) a 1-2 page 'press release' suitable for publication in the popular media.

Required Text:

Principles of Cognitive Neuroscience (2008), Sinauer Associates
Purves, D., Brannon, E.M., Cabeza, R., Huettel, S.A., LaBar, K.S., Platt, M.L., & Woldorff, M.G.

Primary source journal and popular press articles as well as lecture materials will be posted on the Blackboard system. Students should check the course web site frequently.

Assignments and Grading:

Three short essay exams – 45% (15% each exam)
Weekly review papers (1-2 pages, double spaced) – 10%
Class presentation – 10%
Term paper proposal (1-2 pages, double spaced)
Draft of final term paper (10-15 pages, double spaced) - 10% (together with the Proposal)
Final term paper (10-15 pages, double spaced) – 25%

Exams

Three exams will follow each section of the course. These exams will be given in class with the format consisting of short essay questions covering the textbook, lecture, and primary source materials.

Students will be allowed to refer to their own notes during the exam (no textbooks however). Each exam will be worth 15% of the grade.

Weekly Review Papers

Beginning with the third week of class, each student will submit a brief written review of the assigned empirical and popular press articles. The review should be 1-2 double spaced pages briefly describing your opinion of the topic, how the empirical article addressed the question, and how the research was described in the media piece. The review papers should not only cover the main goal of the research, but some of the following additional questions: Did the authors select the optimal method and research tools for achieving their goal? What is your own opinion on the theory, approach, findings, or conclusions of the paper? Students are encouraged to specifically consider how well the research was represented in the media coverage. What aspects of the research were accurately described, and what important aspects were omitted or distorted? What is your opinion on the media coverage?

These assignments are due by 11 pm on each Monday beginning in the third week of class, and should be emailed to BOTH the instructor and the course TA by this deadline. The articles for consideration will be posted on Blackboard. These assignments will be marked as 0 = 'no credit'/1 = 'credit'/2 = 'credit plus'. These 12 weekly writing assignments will be worth 10% of the final grade.

Class Presentation

Each student will participate in a small group (2-3 students) presentation of weekly assigned empirical work affiliated with the Weekly Review Papers. These presentations will be assigned during the second week of class to begin on Tuesday of the third week of class. Presentations should be concise and critical lasting 15-20 minutes. The presentation should focus on providing a clear presentation of (a) Question – what is the main question the paper addresses, (b) Methods – how did the researchers address this question (c) Results (d) Critique and Conclusions, and, if applicable, (e) How the media coverage portrayed the findings. The class presentation will be worth 10% of the final grade.

Term Paper

The final term paper will be a review paper focused on a topic of interest chosen by the student. The final paper will be 10-15 pages (double-spaced) in length, consisting of: (1) a scientific review of a topic related to class discussions, and (2) a 1-2 summary of the topic suitable for publication in the popular media. A 1-2 topic proposal will be due in Week 8 of the course. The proposal should provide a summary of the central question to be addressed in the final paper as well as why the topic would be of interest to the popular press. Students are encouraged to discuss topic selection with the Instructor and/or TA before submission of the proposal. A full draft of the final paper will be due in Week 13 of the course. The research review should include an overview of the question and its importance, a discussion of current theories surrounding the central question, empirical evidence addressing those theories taken from primary sources (e.g., journal articles). A student should review and reference at minimum 5 journal articles. Students should ensure that they properly reference all work and ideas using APA style. A good overview of this style can be found at:

<http://www.docstyles.com/apacrib.htm#Rules>. Together with the Topic Proposal, the draft of the term paper will be worth 10% of the final grade.

The Instructor and/or TA will provide written feedback on the draft term paper. The final term paper should make sure to address this feedback, and will be due during Finals Week. Keep in mind that while grading writing often seems a subjective process there is a lot that can be done to explain the basis of the grade. Your goal when writing is to convince, not to fill. In this regard, just writing a lot does not gain you a better grade. One must make a convincing argument, and this requires building the background and clearly articulating the conclusions that can be drawn from that information. You can

also gain points for, among other things: clear concise writing, innovative thinking, anticipation and countering of opposing view points, and/or a clear grasp of concepts we have covered. You can lose points for, among other things: sloppy spelling and grammar (no excuse for this with spell and grammar checking built into word processing software) or not understanding the concepts you are discussing. Keep in mind that pages over the size range indicated above will not be read. One point that cannot be emphasized enough is that your writing must be YOUR own work. If you are unfamiliar with how you should reference ideas then check with the instructor or the Undergraduate Writing Center (see below). The final term paper will be worth 25% of the final grade.

Undergraduate Writing Center:

I strongly encourage you to use the Undergraduate Writing Center, FAC 211, 471-6222: <http://www.utexas.edu/cola/centers/uwc>. The Undergraduate Writing Center offers free, individualized, expert help with writing for any UT undergraduate, by appointment or on a drop-in basis. Any undergraduate enrolled in a course at UT can visit the UWC for assistance with any writing project. They work with students from every department on campus, for both academic and non-academic writing. Whether you are writing a lab report, a resume, a term paper, a statement for an application, or your own poetry, UWC consultants will be happy to work with you. Their services are not just for writing with "problems." Getting feedback from an informed audience is a normal part of a successful writing project. Consultants help students develop strategies to improve their writing. The assistance they provide is intended to foster independence. Each student determines how to use the consultant's advice. The consultants are trained to help you work on your writing in ways that preserve the integrity of your work.

Prerequisites:

For Psychology Majors:

- (a) PSY 301 with a C or better
- (b) PSY 418 (or an equivalent listed in the course schedule) with a C or better
- (c) Upper-Division standing (60 hours completed)

For Non-Psychology Majors:

- (a) PSY 301 with a C or better
- (b) One of the following courses with a C or better: Biology 318M, Civil Engineering 311S, Economics 329, Educational Psychology 371, Government 350K, Mathematics 316, Psychology 317, Sociology 317L, Social Work 318, Statistics 309
- (c) Upper-Division standing (60 hours completed)

For Everyone:

- (a) Deep curiosity about the brain and its relationship to cognitive functions!

Lecture Schedule:

| Week | Date | Topic | Textbook Reading | Assignment |
|---------|------|--|------------------------|------------|
| W1 T | 1/19 | <i>What is this course about?</i> Introduction to course topics and logistics | | |
| TH | 1/21 | <i>What is the brain?</i> Architecture and basic brain function | Chapter 1 | |
| W2 T | 1/26 | <i>What do neurons do?</i> Neuronal structure and function | Chapter 1; Appendix | |
| TH | 1/28 | <i>How do we study the link between brain, mind, and behavior?</i> Brain perturbations | Chapter 3 | |

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| W3 T | 2/2 | <i>How do we study the link between brain, mind, and behavior?</i> Measuring brain activity | Chapter 3 | Weekly Paper (WP) 1 |
| TH | 2/4 | <i>How does the brain process sensory information?</i> Organization of sensory processing | Chapter 4 | |
| W4 | 2/9 | <i>How does the brain see?</i> Perceiving color and brightness | Chapter 5 | WP2 |
| | 2/11 | <i>How does the brain see?</i> Perceiving form, depth, and motion | Chapter 5 | |
| W5 | 2/16 | <i>How does the brain see?</i> Object and face perception | TBA | WP3 |
| | 2/18 | <i>How does the brain hear?</i> Auditory perception | Chapter 6 | |
| W6 | 2/23 | <i>How does the brain control movement?</i> Motor systems and motor control | Chapters 8-9 | WP4 |
| | 2/25 | EXAM I | | |
| W7 | 3/2 | <i>How does the brain attend?</i> Attentional effects on stimulus processing | Chapters 10-11 | WP5 |
| | 3/4 | <i>How does the brain attend?</i> Attentional control | Chapter 12 | |
| W8 | 3/9 | <i>How does the brain remember?</i> Memory from cells to systems | Chapter 13 | WP6; Topic Proposal Due |
| | 3/11 | <i>How does the brain remember?</i> Declarative memory | Chapter 14 | |
| W9 | 3/16-3/18 | <i>Spring Break</i> | | |
| W10 | 3/23 | <i>How does the brain remember?</i> Nondeclarative memory | Chapter 15 | WP7 |
| | 3/25 | <i>How does the brain remember?</i> Working memory | Chapter 16 | |
| W11 | 3/30 | <i>How does the brain support emotional experience?</i> Emotional influences on cognition | Chapters 17-18 | WP8 |
| | 4/1 | EXAM II | | |
| W12 | 4/6 | <i>How does the brain support interactions between people?</i> Social cognitive neuroscience | Chapter 19 | WP9 |
| | 4/8 | <i>How is cognition controlled?</i> Executive function and the frontal lobes | Chapter 23 | |
| W13 | 4/13 | <i>How do we make decisions?</i> Reward, feedback, and neuroeconomics | Chapter 24 | WP10; Draft of Final Paper Due |
| | 4/15 | <i>How does the brain support symbolic representation?</i> Speech and language | Chapters 20-21 | |
| W14 | 4/20 | <i>How does experience change the brain?</i> Cognitive and neural development | Chapter 27 | WP11 |
| | 4/22 | <i>How does the brain age?</i> Cognitive aging | TBA | |
| W15 | 4/27 | <i>How has the brain evolved?</i> Evolutionary cognitive neuroscience | Chapter 26 | WP12 |
| | 4/29 | <i>How do we study consciousness and the brain?</i> | Chapter 28 | |

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|--------------------|------|---|--|------------------------|
| W16 | 5/4 | <i>Pulling it all together:</i> Summary and review | | |
| | 5/6 | EXAM III | | |
| Finals Week | 5/12 | Final Term Paper Due by 5 pm | | Final Paper Due |

The Standard of Academic Integrity:

A fundamental principle for any educational institution, academic integrity is highly valued and seriously regarded at The University of Texas at Austin, as emphasized in the standards of conduct. More specifically, you and other students are expected to "maintain absolute integrity and a high standard of individual honor in scholastic work" undertaken at the University ([Sec. 11-801](#), *Institutional Rules on Student Services and Activities*). This is a very basic expectation that is further reinforced by the University's [Honor Code](#). At a minimum, you should complete any assignments, exams, and other scholastic endeavors with the utmost honesty, which requires you to:

- acknowledge the contributions of other sources to your scholastic efforts;
- complete your assignments independently unless expressly authorized to seek or obtain assistance in preparing them;
- follow instructions for assignments and exams, and observe the standards of your academic discipline; and
- avoid engaging in any form of academic dishonesty on behalf of yourself or another student.

For the official policies on academic integrity and scholastic dishonesty, please refer to [Chapter 11](#) of the *Institutional Rules on Student Services and Activities*.

Because writing is a major component of this course, it is important to understand how to appropriately reference and acknowledge the sources used in your writing. Plagiarism will not be tolerated for any of the assignments including weekly papers, exams, drafts of paper, and final papers. The University of Texas defines plagiarism as "the appropriation of, buying, receiving as a gift, or obtaining by any means material that is attributable in whole or in part to another source, including words, ideas, illustrations, structure, computer code, or other expression or media, and presenting that material as one's own academic work being offered for credit." In lay terms, plagiarism is using someone else's work as your own work without giving proper credit. To understand how to properly cite and paraphrase the work and ideas of others, a tutorial regarding plagiarism is available at:

<http://www.lib.utexas.edu/services/instruction/learningmodules/plagiarism/>

The University of Texas Honor Code:

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

University Electronic Mail Notification Policy:

All students should become familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. It is recommended that e-mail be checked daily, but at a minimum, twice per week.

Use of Blackboard in Class:

This course uses Blackboard, a Web-based course management system in which a password-protected site is created for each course. (Student enrollments in each course are updated each evening.) Blackboard can be used to distribute course materials, to communicate and collaborate online, to post grades, to submit assignments, and to take online quizzes and surveys.

You will be responsible for checking the Blackboard course site regularly for class work and announcements. As with all computer systems, there are occasional scheduled downtimes as well as unanticipated disruptions. Notification of these disruptions will be posted on the Blackboard login page. Scheduled downtimes are not an excuse for late work. However, if there is an unscheduled downtime for a significant period of time, I will make an adjustment if it occurs close to the due date.

Blackboard is available at <http://courses.utexas.edu>. Support is provided by the ITS Help Desk at 475-9400 Monday through Friday 8 am to 6 pm, so plan accordingly.

Disability Statement:

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY.

Students who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259- voice or 471 -4641 - TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of" the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed.

See Web site below for more information:

<http://deanofstudents.utexas.edu/ssd/providing.php>

Religious Holidays:

Religious holy days sometimes conflict with class and examination schedules. If you miss an examination, work assignment, or other project due to the observance of a religious holy day you will be given an opportunity to complete the work missed within a reasonable time after the absence. It is the policy of The University of Texas at Austin that you must notify each of your instructors at least fourteen days prior to the classes scheduled on dates you will be absent to observe a religious holy day.

Feedback:

Feedback is an important part of any learning. Without feedback on how well you understand the material or your proficiency in a skill, it is more difficult to make significant progress. During this course I will be asking you to give me feedback on your learning in informal as well as formal ways such as assignments or exams. Please let me know when something we discuss is not clear. It will enable me to provide additional information when needed or to explain a concept in different terms.