

Cognitive Science: Brain and Cognition
Q301: Spring, 2015

Professor: Brown

Meetings: 11:15A-12:30P Tu/Th, Psychology 228

Office hours: Tues. 1:30-2:30 and by appointment, Psychology Bldg. 336

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Course Description: This course asks a deceptively simple question: how do the neurons and areas of the brain work together to accomplish the vast range of human behaviors? To answer this question, we first cover the basics of brain neuroscience and then attempt to link these with a variety of human capacities studied by cognitive psychologists. We will look at areas such as: perception, attention, memory, learning through synaptic plasticity, language, consciousness and intelligence. The course uses a problem-based learning approach that stresses realistic problems as a technique to organize the course materials.

Course Requirements (500 total points possible):

Attendance:	50 points
In-class assignments/quizzes	40 points
Assignment 1: Neurodude – nerve function	30 points
Assignment 2: functional MRI	30 points
Assignment 3: (Group) Prosthetic vision	40 points
Assignment 4: Popular press	30 points
Assignment 5: Epilepsy surgery	30 points
Midterm:	100 points
Final (cumulative):	150 points

Grading Scale: (minimum number of total points required for letter grade)

A	93-100%	(465 points)	C	73-76%	(365 points)
A-	90-92%	(450 points)	C-	70-72%	(350 points)
B+	87-89%	(435 points)	D+	67-69%	(335 points)
B	83-86%	(415 points)	D	63-66%	(315 points)
B-	80-82%	(400 points)	D-	60-62%	(300 points)
C+	77-79%	(385 points)	F	00-59%	(0 points)

The overall course grade of “A+” will be reserved for truly exceptional performance.

Course Policies:

There are no formal prerequisites for enrollment in this course, although students should have some background in psychology such as Psychology 101.

Students are expected to be familiar with Canvas and to know how to download materials from and submit assignments to Canvas (<http://canvas.iu.edu>). Readings and materials that are not

contained in the required texts will be placed online with Canvas. All readings should be completed before the first class session of the week in which they are to be discussed.

Active participation and respect by all enrolled students is expected. Prompt and regular attendance is expected barring extraordinary circumstances. In-class assignments will be given periodically throughout the semester as a learning exercise and a measure of participation in class sessions. Attendance will also be taken at each class session. Bring blank paper and a writing instrument (pen or pencil) to each class so that you can complete and submit in-class assignments.

If a student misses a class session for any reason (including flu or other illness, family emergency, travel for IU athletic participation, over-slept, etc.), the student may still earn full credit for participation by doing all of the following WITHIN TWO WEEKS of the missed class session. (1) Review the lecture slides/notes from Canvas from the missed class. (2) Write a summary of the material covered during the missed class session (minimum of 300 words). This summary should provide written definitions of concepts discussed in the course notes and provide examples of how the concepts are applied as appropriate. (3) Students must complete any in-class assignments that were given during the missed session, providing written responses to the assignment questions. (4) The written summary and responses to any in-class assignments must be emailed to the AI as soon as possible but not later than 14 calendar days of the missed class session, with the subject line: "Q301: Attendance makeup [date]", where [date] is the date of the missed class session.

Turn off cell phone ringers during class. You are responsible for checking your official IU email account regularly for course communications. Prepare for all assignments in advance so that last-minute glitches do not catch you off guard, e.g. an internet connection fails right when an assignment is due or your computer crashes; none of these constitute acceptable excuses. Due dates are final deadlines. Late written work will be penalized at the rate of one grade deduction per day (i.e. a "B+" becomes a "B"). Extensions for written work will be granted only in exceptional circumstances, e.g. documented (bring me a paper copy that I can keep) medical or family emergency; if you know that you will need an extension, talk to me as far in advance as possible—do not wait until the day the paper is due.

If a student desires feedback from the professor regarding a draft of an assignment prior to the due date, the student may bring a copy of the draft to the professor for consultation in person during office hours and not by email. If feedback is solicited, students will be expected to use the feedback in revising the paper.

There is no make-up midterm examination; unexcused absence will result in a failing exam grade. In the rare case of an excused absence from the midterm examination (e.g. documented medical or family emergency), the midterm grade reported will be based upon other grades received up to that point, and the final examination will count for 250 points. The final examination must be taken as scheduled. A student who fails to attend the final examination and who has a passing grade up to that point will receive an Incomplete only if the professor has reason to believe that the absence was beyond the student's control. If not, the grade of "F" must be awarded, in accordance with University policies. In particular, purchasing airfare to leave town before the final exam or otherwise leaving town voluntarily before the final exam are NOT acceptable excuses that merit special arrangements for an early final exam. Students who anticipate absence from the final examination, or who are absent from the final examination for

reasons they did not anticipate, should discuss their absence with the professor as soon as possible to make arrangements for the satisfaction of course requirements. At the professor's discretion, any student absent from the final examination must file a written explanation of the absence with the Dean of Students Office in Franklin Hall 108.

Studying together is encouraged, but all written work (including assignments, quizzes, and exams) must be original and completed individually, except for assignments explicitly given as group assignments. No notes, outlines, readings, cell phones, laptops, or other programmable electronic devices are permitted during examinations. Any personal item with an on-off switch must be turned off during examinations. No assistance from other students or anyone else is allowed during examinations. The University reserves the right to penalize any student whose academic conduct at any time is, in its judgment, detrimental to the University. Such Conduct shall include cases of plagiarism, collusion, cheating, giving or receiving or offering or soliciting information in examinations, or the use of previously prepared material in examinations or quizzes. Violations should be reported to the professor, who will investigate and adjudicate allegations. In accordance with University policies, all incidents of academic misconduct will be reported to the Dean of Students. Cases of plagiarism or other dishonesty will most likely result in a failing course grade. Plagiarism includes failing to properly cite and acknowledge outside sources used in your written paper assignments, such as websites, books, other people, and custom paper-writing "services" on the internet. You must acknowledge the source of any other material you use, even if you paraphrase it, and quoted material must be enclosed by quotation marks. Be warned: many students have recently been caught plagiarizing from sources that supposedly passed automated plagiarism checks. The safest and right thing to do is to write your own papers and cite your sources properly. For further clarification, see the "Code of Student Rights, Responsibilities, and Conduct," <http://www.iu.edu/~code/>.

If any student will require assistance or appropriate academic accommodations for a disability, please contact the professor after class, during office hours, or by appointment as early as possible in the semester. Eligibility for disability support services must first be established through the Office of Disabled Student Services in Franklin Hall 096, (812) 855-7578, <http://studentaffairs.iub.edu/dss/>. Confidentiality will be observed in all inquiries.

If any student anticipates absences due to religious conflicts or religious holidays, satisfactory arrangements must be made with the professor during the first two weeks of the semester.

This syllabus is not a legal contract; it is subject to change as needed at the professor's discretion. If changes are made, notice will be given in class in advance.

Required Text (available as e-text from Courseload/Canvas)

Gazzaniga M, Ivry R, Mangun G. (2013) *Cognitive Neuroscience: The biology of the mind*. 4th ed. New York: W.W. Norton

Schedule:

Week 1: Jan. 13, 15 Ch. 1. Introduction to cognitive neuroscience. History.

Week 2: Jan. 20, 22 Ch. 2, part 1 (pp. 23-36). Cellular & Molecular basis of cognition. Neurons, spikes, etc.

Week 3: Jan. 27, 29 Ch. 2, part 2 (pp. 37-59). Neuroanatomy.
Special human brain lab in class 1/29
Assignment 1 (Neurodoodle exercise) due 1/29 by beginning of class

Week 4: Feb 3, 5 Ch. 3. Methods of Cognitive Neuroscience. fMRI, PET, EEG, TMS, MEG,
Neurophysiology. EEG for brain/computer interfaces

Week 5: Feb. 10, 12 Ch. 5. Sensation and Perception.

Week 6: Feb. 17, 19 Ch. 6. Higher perceptual functions.
Assignment 2 (fMRI analysis exercise) due 2/19 by beginning of class

Week 7: Feb. 25, 26 Ch. 7. Attention and Consciousness.

Week 8: Mar. 3, 5 Ch. 9. Learning and memory.

Week 9: Mar. 10, 12 Ch. 11. Language.
The midterm exam will be held in class 3/10.
Assignment 3 (Group project on prosthetic vision) due 3/12 by beginning of class

Spring Break Mar 17, 19 – No Class

Week 10: Mar 24, 26 Ch. 4. Lateralization.

Week 11: Mar. 31, Apr. 2 Ch. 8. Control of action.
Assignment 4 (Cognitive neuroscience in the media) due Apr. 2 by beginning of class

Week 12: Apr 7, 9 Ch. 12. Cognitive Control.

Week 13: Apr. 14, 16 Ch. 10. Emotion.

Week 14: Apr. 21, 23 Ch. 13. Social Cognition.
Assignment 5 (Advice for epilepsy surgery) due Apr. 23 by beginning of class

Week 15: Apr. 28, 30 Review, discussion of course material. Free week.

Final Exam: 10:15 a.m.-12:15 p.m., Thurs., May 7