

## Syllabus – August 26

Cognitive Neuroscience (cogNeuro) explores the biological foundations of mental phenomena. It tries to understand how your brain makes your mind possible.

cogNeuro builds on some well-established disciplines, but, as a distinct entity in its own right, cogNeuro is a new arrival, and some of what it seeks to understand remains, for the moment, beyond our reach. The field and this course focus on neurons, brain structures, and neural function that are the biological foundation of the mind. cogNeuro assumes that any idea, perception, memory, action, decision or thought reflects a brain state. Moreover, cogNeuro assumes that the mind is not in one spot in the brain, but emerges from interactions among individual neurons and ensembles of neurons.

To carry out its ambitious, important and fascinating program, cogNeuro exploits a range of tools and techniques that reveal the workings of the mind on temporal and spatial scales that range from milliseconds and ion channels, at one end of these two scales, up to hours and thousands of cubic centimeters, at their other end.

**TEXTBOOK:** The course's textbook is *Cognitive Neuroscience: The Biology of the Mind* (3rd edition, 2009), by M. Gazzaniga, R. Ivry and G. Mangun. The book, referred to as GIM in the list of reading assignments below, will be supplemented by short articles downloadable from *Latté*. Those articles are not identified on the attached, alpha version of the reading schedule, but will be added on subsequent versions. I expect students to take an active, constructive role in class discussion. That role can only be fulfilled if you have done –and thought about– the reading before coming to class. By enrolling in this course, you are signaling your personal commitment to complete assigned readings *before* class.

**REACTION PAPERS:** For each of two reaction papers, you read a scientific paper critically, evaluate it –consider its worth and its shortcomings – and express your reaction in a reasoned argument. The assigned targets for your reaction papers will be recent, relatively-short new papers in cogNeuro. Each reaction paper will be correspondingly short, ~1500 words. Such papers are an excellent way to hone and exercise your skills as a critical consumer of current science.

**BLOGGING AND CO-BLOGGING:** A co-blog is generated by two or more people who blog about a shared topic. The course will exploit an innovative, specially-designed co-blogging environment that affords a forum for online discussion of this course's material. Starting in Week Two of the semester, you will be required to blog at least twice a week, with each blog entry at least two paragraphs long. An entry might, for

example, summarize in your own words the key content or idea(s) of the week's reading, or develop an argument on an issue that was discussed during a class meeting. That's blogging; for *co*-blogging, you will be required to read the blogs of at least two other students each week, and at least once a week comment on another student's blog entry in the discussion page associated with that blog entry. To facilitate this, our co-blogging environment will let you know who is reading your blog postings, and who has commented on them. Needless to say, you should regularly respond to comments you receive on your own blog entries; don't ignore your co-blogging classmates. That would subvert the co-blog and reduce its pedagogical value for you and others. Much more information about the co-blogging environment, and this requirement will be provided in class.

**EVALUATION:** Approximately 75% of the course grade will reflect your performance on the three exams. The first two exams carry equal weight; the third exam will carry a weight 1.5× that of either of the first two exams. The third examination will emphasize material from the final portion of the course, but will draw on material from the entire course. Approximately 15% of the course grade will be determined by your participation in the co-blog, with the remainder of the course grade determined by your two short reaction papers. Incidentally, you should know that performance on exams and participation in co-blogging are strongly correlated. Although this will be the initial deployment of a co-blog in this course, when a co-blog has been used in some other courses, students who participated vigorously in the co-blog also tended to do best on exams. A word to the wise.

**MAKEUP EXAMS:** Makeup exams will be given *only* with *prior* agreement from the instructor; there will be no exceptions. Also, if a medical condition is the cause for the request, a physician's written documentation of a *serious* medical condition must be provided.

**CONTACTS:** The instructor's office is Volen Center, Room 242. His e-mail address is <mailto:vision@brandeis.edu>. Office hours: Wednesdays, 3:30 to 5 p.m. Our excellent teaching assistants are Jie Huang and Rebecca Kreipke. Their e-mail addresses are <mailto:jiehuang@brandeis.edu> and <mailto:rek@brandeis.edu>, respectively.

**ACCOMMODATION FOR DISABILITY:** As in every course at Brandeis, a student with a diagnosed disability should alert the instructor as possible to any special needs that arise from that disability, and provide documentation of the disability.

<b>Dates</b>	<b>Topic</b>	<b>Readings</b>	<b>Notes</b>
8/31	Introduction/Orientation	GIM: Chpt 1	
9/2, 9/9 9/14	Neurons, channels, spikes, transmitters, synapses	GIM: Chpt 2	
9/16, 9/21	Nervous system: Organization, principles	GIM: Chpt 3	
9/23, 9/28	Methods of cognitive neuroscience	GIM: Chpt 4	
<b>9/30</b>		<i>Exam</i>	
10/7, 10/12, 10/14	Sensation/Perception, Object Recognition	GIM: Chpt 5, 6	
10/19, 10/21, 10/26	Learning and memory	GIM: Chpt 8	
10/28, 11/2	Control of Action	GIM: Chpt 7	
<b>11/4</b>		<i>Exam</i>	
11/9, 11/11, 11/16	Attention!!	GIM: Chpt 12	
11/18, 11/23	Cognitive control	GIM: Chpt 13	
11/30, 12/2	Autism Spectrum Disorders	Readings: TBA	
<b>12/9</b>	<b>6-9 PM</b>	<i>Final Exam</i>	

Note: The reading schedule above is the alpha version, and is subject to revision. Once the semester starts, the dates for the three exams are not subject to revision. Please review those dates now, and verify that you do not have any obligation that might preclude your taking exams on the dates scheduled.