

## Syllabus

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

Although CogNeuro builds on various older disciplines, as a distinct entity it is very young, and some of what it seeks to understand remains, for the moment, beyond reach. The field and this course focus on neurons, brain structures, and neural function. CogNeuro assumes that any idea, perception, memory, action, decision or thought reflects a brain state. CogNeuro assumes that the mind is not in one spot in the brain, but emerges from interactions among individual neurons and among ensembles of neurons.

To carry out its ambitious and important program, CogNeuro uses an enormous range of tools and techniques, and operates at an equally broad range of scales –from the miniscule (ion channels) to the huge (~6.6 kg of an average adult human brain).

**TEXTBOOK:** The course's textbook is *Cognitive Neuroscience: The Biology of the Mind* (2nd edition), by Gazzaniga, Ivry and Mangun. The book, referred to as GIM in the list of reading assignments, will be supplemented by short articles downloadable from *Latte*. Those articles are not designated on the attached reading schedule.

**EXPECTATION:** I expect students to take an active, constructive role in class discussion. That role can only be fulfilled if students have done –and thought about– the reading. By signing up for this course, you signal your personal commitment to complete assigned readings before coming to class.

**EVALUATION:** Your course grade will primarily reflect your performance on three exams. The first two exams will carry equal weight; the third exam will be weighted 1.5 times as much as 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. At the instructor's discretion, some student(s) may receive bonus point for substantive contributions to class discussion.

**MAKEUP EXAMS:** Makeup exams will be given only with prior agreement from the instructor; if a medical condition is involved, a physician's written documentation of a serious medical condition must be provided.

**CONTACT:** The instructor's office is in Volen Center for Complex Systems, Room 242. His e-mail address is [vision@brandeis.edu](mailto:vision@brandeis.edu). Office hours TBA.

Note: The reading schedule below will be augmented and revised during the first two weeks of class.

Schedule (alpha version)

<b>Dates</b>	<b>Topic</b>	<b>Readings</b>	<b>Notes</b>
8/31	Introduction/Orientation	GIM: Chpt 1	
9/4/ 9/7, 9/11	Neurons, channels, spikes, transmitters, synapses	GIM: Chpt 2	
9/18, 9/21	Nervous system: Organization, principles	GIM: Chpt 3	
9/25, 9/28	Methods of cognitive neuroscience	GIM: Chpt 4	
<b>10/2</b>	<b>Exam</b>		
10/5, 10/12	Vision and the visual system	GIM: Chpt 5	
10/16, 10/19	Visual system and seeing	GIM: Chpt 6	
10/23, 10/26	Attention!!	GIM: Chpt 7	
10/30, 11/2, 11/6	Learning and memory	GIM: Chpt 8	
<b>11/9</b>	<b>Exam</b>		
11/13, 11/16	Motor control	GIM: Chpt 11	
11/20, 11/27, 11/30	Executive function and decision making	GIM: Chpt 12	
12/4, 12/7	Neuroethics + Wrapup		
<b>12/12</b>	<b>Final Exam</b>		
<b>9/14, 10/19, 11/23</b>	<b>No Class</b>		

As in all courses at Brandeis, students 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.