MIND AND BRAIN
Course Schedule

The study of the mind’s complex processes - perception, language, attention, memory, motor control, feelings, and consciousness is a task that becomes feasible with the convergence of the disciplines of cognitive psychology, behavioral neurology, and neuroscience. This course, Mind and Brain, covers these understandings of the mechanisms of the mind. The lectures are organized into fourteen topics. One topic will be taught every week.

• (8/26) Topic 1. Introduction: An overview of the physical principles of neuroscience, from the neuron to the neural system.

• (8/31) Topic 2. The Methods of Cognitive Neuroscience: Methodological approaches like cognitive logic, neuropsychological analysis of patients, and functional neuroimaging.

• (9/7) Topic 3. Perception and Encoding: Demonstrate how the brain converts sensory signals into a perception of a coherent world through explorations of visual illusions, color perception, motion blindness, sound localization, and etc.

• (9/14) Topic 4. Higher Perceptual Functions: Some other features and quirks of human sensory perception.

• (9/21) Topic 5. Selective Attention and Orienting: The examination of attention looks at how internal desires, beliefs, momentary necessities, and intent affect human perceptual experience. How, for example, are we able to focus on a single conversation at a noisy party? What happens when attention is lost due to stroke or injury?

• (9/28) Topic 6. Learning and Memory: These relate directly to our ability to acquire and retain information about the world and our experiences of it. Are all memories created equal? How is it possible that we can remember our first day of school but cannot remember the days before or after? Is legal eyewitness testimony something we should ever trust?

• (10/5) Topic 7. Language and the Brain: We look at language (the dramatic dividing line between humans and other primates) by exploring the biological basis of semantics and word recognition and examining such language disorders as aphasia, deficits in language comprehension and production, and anoma, the inability to name things in the world.

• (10/12) Topic 8. Cerebral Lateralization and Specialization: Hemispheric specialization is covered with an extensive study of patients who for the purposes of controlling epilepsy have had the left and right sides of their brains disconnected. We also explore the controversial topic of the relation between handedness and hemispheric dominance.

• (10/19) Topic 9. The Control of Action: We discuss how the human brain works in tandem with the body, particularly to create complex actions, such as playing a piano, that require the two hands to integrate their movements. The interruption of voluntary control as in victims of Parkinson’s disease is also examined.

• (10/26) Essay writing day (no class).

• (10/28) Field Trip 1. Sensory and motor integration at CCSBS.

• (11/2) Topic 10. Executive Functions and Frontal Lobes: We explain executive function the job of the frontal lobes by looking at how this area of the brain activates memory for usage, regulating social behavior, and influencing decision making.


• (11/11) Veteran’s Day (no class).

• (11/18) Topic 12. Evolutionary Perspectives: The evolution of cognition is explored - why natural selection produced such oddities as the differences in spatial and mathematical abilities between the genders, the evolutionary basis of emotions, the nature of learning, and evolutionary insights to human brain organization.

• (11/25) Thanksgiving Recess (no class).

• (11/30) Field Trip 2. Structure and functional imaging at University MRI.