**Course Description**

This course will provide an introduction to what we know, and what we are still figuring out, about the intriguing link between the brain, the mind, and behavior. We will start with a basic review of the brain as a biological organ, including its basic structure and operations. Next, we will discuss how the brain gives rise to a wide variety of complex behaviors, from the ability to sense and perceive what is happening in the world, to the ability to learn, think, remember, and control our environment.

**Readings**

The main textbook will be *Principles of Cognitive Neuroscience*, by Dale Purves et al., (Sinauer Press, 2012, 2nd edition). This textbook will provide the primary reading source.

Additional supplements from articles and other book chapters will be available online as discussed in class. This information will be posted on Courseworks, in a folder called “Readings” under “Files & Resources”.

Slides will be posted on Courseworks after each class, in a folder called “Class Slides”, under “Files & Resources”.

**Exams**

Format: Multiple choice, fill-in and short essay questions.

Make-up exams: Will be allowed only with written justification and will be given only at a single date.

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<tr>
<th>Date</th>
<th>Topics Covered</th>
<th>% Grade</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>Feb. 18th</td>
<td>Section 1 - Basics of neuroscience: how the brain works</td>
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<td>Exam 2</td>
<td>April 3rd</td>
<td>Section 2 - Cognitive Neuroscience I: how the brain supports perception and memory</td>
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<tr>
<td>Final Exam</td>
<td>May 13th</td>
<td>All sections covered in the course</td>
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**Experiments**

Participation in the experiment subject pool can earn you up to 6 credits, each worth 1/2 a point towards your final grade (for a maximum of 3 points).
Class Schedule

Wednesday, January 23rd: What’s this course about?
Introduction to the study of mind, brain and behavior

Monday, January 28th: What is the brain?
Introduction to the brain, its architecture and basic functional features
   Required reading: Appendix

Wednesday, January 30th: What are neurons?
From general architecture to cell structure and function
   Required reading: Appendix

Monday, February 4th: What do neurons do?
Action potentials, neuronal firing and neurotransmitters
   Required reading: Assigned Readings

Wednesday, February 6th: How do we study the link between brain, mind, and behavior?
Methods I: Perturbing the brain
   Required reading: Chapter 2

Monday, February 11th: How do we study the link between brain, mind, and behavior?
Methods II: Observing the brain in action
   Required reading: Chapter 2

Wednesday, February 13th: Summary and review
Brain organization, neurotransmission and methods

Monday, February 18th: Exam #1 (20% of grade)

Wednesday, February 20th: How is sensory information processed in the brain?
Organization of sensory processing
   Required reading: Chapters 3& 4

Monday, February 25th: How does the brain process visual input?
Perception of visual stimuli (Guest speaker: Christine Constantinople)
   Required reading: Chapters 3

Wednesday, February 27th: How does the brain process auditory sensation?
Perception of sounds (Guest speaker: Joe Schumacher)
   Required reading: Chapters 4

Monday, March 4th: How does the brain control movement?
Motor systems and motor control
   Required reading: Chapter 5

Wednesday, March 6th: What are the neural processes underlying attention?
Neural and cognitive mechanisms of attention
   Required reading: Chapter 6–7

Monday, March 11th: How does the brain create memories?
I. Learning and memory in the brain: From cells to systems
   Required reading: Chapter 8
Wednesday, March 13th: How does the brain create memories?  
II. Different neural systems support different kinds of memories  
   Required reading: Chapter 8-9

Spring Break

Monday, March 25th: Vision and Perception  
   (Review Chapter 3)

Wednesday, March 27th: The Emotional Brain  
   Required reading: Chapter 10

Monday, April 1st: Summary and review

Wednesday, April 3rd: Exam #2 (30% of grade)

Monday, April 8th: The social brain  
   Required reading: Chapter 11

Wednesday, April 10th: How is cognition controlled?  
   Executive function and the frontal lobes  
   Required reading: Chapter 13

Monday, April 15th: Dopamine, Drugs, and Behavior  
   Guest Speaker: Suzanne Wood  
   Required reading: Chapter 14

Wednesday, April 17th: How do we make decisions?  
   Reward, feedback and neuroeconomics, (Guest Speaker: Raphael Gerraty)  
   Required reading: Chapter 14

Monday, April 22nd: How does experience change the brain?  
   Cognitive and neural development  
   Required reading: Chapter 15

Wednesday, April 24th: What happens in the brain of a teenager?  
   Brain changes during adolescence (Guest speaker: Juliet Davidow)  
   Required reading: Assigned readings

Monday, April 29th: The bilingual brain  

Wednesday, May 1st: The social brain  
   (rescheduled from 4/8)

Monday, May 6th: Catch Up/Review; new cool stuff about the brain.

Monday, May 13th: Exam #3 (50% of grade)