

**Mind, Brain and Behavior  
Psychology, W1010  
Spring 2012  
Dr. Jason Buhle  
jtb2102@columbia.edu**

**\*\*Note: this syllabus is subject to change. Please always check CourseWorks for the most current version.**

**When and Where**

501 Schermerhorn Hall  
Tuesday and Thursday, 9:10-10:25 a.m.

**Teaching assistants**

Please email **mbbquestions@gmail.com** with all general questions, comments and concerns. Different TAs will monitor this account on different weeks to make sure replies are as quick as possible.

If you have questions for a specific TA (e.g., scheduling an appointment) contact her directly:

Heather Van Volkinburg (hkv1@columbia.edu)

Jen Silvers (jas2222@columbia.edu)

Abbey Vandersall (aev2111@columbia.edu)

Mary Shorey (mes2216@columbia.edu)

Tani Pollock (nip2101@columbia.edu)

**Office hours**

Jason: Tuesday & Thursday, 10:30-11:30 a.m., 356 Schermerhorn Extension

Heather: Thursday, 10:30 a.m.-12:30 p.m., 360 Engineering Terrace/Schermerhorn Extension

Jen: Tuesday, 11:30 a.m.-12:30 p.m. & 3-4 p.m., 324A Schermerhorn

Abbey: Monday 11 a.m.-1 p.m., 318C Schermerhorn

Mary: Friday 3 p.m.- 5 p.m., 318C Schermerhorn

Tani: Wednesday 11 a.m.-1 p.m., 318 Schermerhorn

## Course description

This course will provide an introduction to the multidisciplinary study of mind, brain, and behavior. We will start with a basic review of the brain as a biological organ, and its basic operations. Next, we will discuss how this organ gives rise to a wide variety of mental functions and behaviors, from the ability to sense and perceive what is happening in the world, to the ability to learn, think, remember, and respond to our environment.

## Readings

All assigned readings will be from *Principles of Cognitive Neuroscience*, Purves et al., 2008 (available through the bookstore). Additional supplements from articles and other book chapters will be available online as discussed in class.

## Methods of evaluation

### Exams

All exams will consist of a mixture of multiple choice, fill-in-the-blank and short answer questions. Make-up exams will only be permitted with a letter from your dean.

	Date	Topics Covered	% Final Grade
Exam 1	February 7 <sup>th</sup>	Section 1: Basic neuroscience, methods and tools	20%
Exam 2	March 29 <sup>th</sup>	Section 2: Sensation, perception, attention, memory, working memory, social behavior and emotion	30%
Final Exam	May 10 <sup>th</sup> (tentative)	All sections in the course	50%

### Optional self-tests

You can earn ½ point extra credit on final grade for each self-test (11 tests, for up to 5.5 total points extra). Self-tests are all-or-nothing—if you make any mistakes, you will not get any extra credit for that test. See the section “Self-tests” below for more information.

### Optional experimental participation

You may earn 2 points extra credit on your final grade for participating in 3 hours of psychology research through the department participant pool (6 research credits.) You must

earn all 6 research credits to earn the extra credit. No partial extra credit will be given. The first day you can earn credits is the first day of classes, and the last day you can earn credit is the last day of classes. Information about how to sign up for experiments will be posted on CourseWorks.

## **Self-tests**

Self-tests are optional quizzes made up of questions that integrate the most important material from the lectures and book. Self-tests can:

- 1) Help you to keep up with and reinforce key points in the reading and lectures;
  - 2) Help your grade. Each test can earn you up to a ½ point extra credit on final grade (11 tests and 5.5 points total).
- Self-tests are posted on-line Thursday afternoon.
  - All work on self-tests must be your own. You can discuss the material with your peers, but you cannot submit identical answers.
  - Self-tests are due before the start of class the following Thursday (9:10 a.m.). You must submit them through CourseWorks (Tests & Quizzes). We strongly recommend that you first write out your response and spell check it in word processing program and then paste it into CourseWorks. Late self-tests will not be counted. No make-up self-tests will be allowed.
  - Each self-test will cover all new material since the last self-test. Typically this will consist of Tuesday readings and lecture and Thursday readings of the week on which it is due (i.e., the week after it is posted).
  - Answers will be posted on the website Thursday after class.

## **Classroom policies**

You may not use phones, laptops etc. for anything not directly related to the course (such as taking notes).

## Calendar

Date	Topic	Readings	Self-test
January 17 <sup>th</sup> – Tuesday	<i>What is this course about?</i> Introduction to the study of mind, brain and behavior		
January 19 <sup>th</sup> – Thursday	<i>What is the brain?</i> Introduction to the brain, its architecture and basic functional features	Chapter 1	
January 24 <sup>th</sup> – Tuesday	<i>What are neurons?</i> From general architecture to cell structure and function	Chapter 1	
January 26 <sup>th</sup> – Thursday	<i>What do neurons do?</i> Action potentials and neuronal firing	Appendix	Self-test #1 Due
January 31 <sup>st</sup> – Tuesday	<i>How do we study the link between brain, mind, and behavior in animals?</i> Neurochemistry, neurophysiology, lesions, genetics	Chapter 3	
February 2 <sup>nd</sup> – Thursday	<i>How do we study the link between brain, mind, and behavior in humans?</i> Functional imaging, neuropsychology, brain stimulation	Chapter 3	Self-test #2 Due
February 7 <sup>th</sup> – Tuesday	<b>Exam #1</b>		
February 9 <sup>th</sup> – Thursday	<i>How is sensory information processed in the brain?</i> Organization of sensory processing	Chapter 4	
February 14 <sup>th</sup> – Tuesday	<i>How does the brain process visual input?</i> Perception of visual stimuli	Chapter 5	
February 16 <sup>th</sup> – Thursday	<i>What are the neural processes underlying attention?</i> Neural and cognitive mechanisms of attention	Chapter 10	Self-test #3 Due
February 21 <sup>st</sup> – Tuesday	<i>How does attention enhance stimulus processing?</i>	Chapter 11	
February 23 <sup>rd</sup> –	<i>How is attention controlled?</i>	Chapter 12	Self-test #4

Thursday			Due
February 28 <sup>th</sup> – Tuesday	<i>How does the brain create memories?</i> I. Learning and memory in the brain: From Cells to System	Chapter 13	
March 1 <sup>st</sup> – Thursday	<i>What happens when memory is lost?</i> (Class movie)		Self-test #5 Due
March 6 <sup>th</sup> – Tuesday	<i>How does the brain create memories?</i> II. Different neural systems support different kinds of learning	Chapter 14-15	
March 8 <sup>th</sup> – Thursday	<i>How does the brain perform online maintenance and manipulation of information?</i> Working memory	Chapter 16	Self-test #6 Due
March 13 <sup>th</sup> – Tuesday	Spring break		
March 15 <sup>th</sup> – Thursday	Spring break		
March 20 <sup>th</sup> – Tuesday	<i>What are the neural mechanisms underlying social and emotional behavior?</i> I. Introduction to emotion	Chapter 17	
March 22 <sup>nd</sup> – Thursday	<i>What are the neural mechanisms underlying social and emotional behavior?</i> II. Emotion and Cognition	Chapter 18-19	Self-test #7 Due
March 27 <sup>th</sup> – Tuesday	Summary and review: pulling it all together		
March 29 <sup>th</sup> – Thursday	<b>Exam #2</b>		
April 3 <sup>rd</sup> – Tuesday	<i>What are the neural bases of language?</i> (Guest lecture: Heather Van Volkinburg)	Chapter 20-21	
April 5 <sup>th</sup> – Thursday	<i>How is time represented in the brain?</i>	Chapter 22	Self-test #8 Due
April 10 <sup>th</sup> – Tuesday	<i>How is cognition controlled?</i> Executive function and the frontal Lobe	Chapter 23	

April 12 <sup>th</sup> – Thursday	<i>How do we make decisions?</i> Reward, feedback and neuroeconomics	Chapter 24	Self-test #9 Due
April 17 <sup>th</sup> – Tuesday	<i>How did the brain and cognition evolve?</i>	Chapter 26	
April 19 <sup>th</sup> – Thursday	<i>How does experience change the brain?</i> Cognitive and neural development (Guest lecture: Jen Silvers)	Chapter 27	Self-test #10 Due
April 24 <sup>th</sup> – Tuesday	<i>How do we study consciousness and the brain?</i>	Chapter 28	
April 26 <sup>th</sup> – Thursday	Summary and review: pulling it all together		Self-test #11 Due
May 1 <sup>st</sup> – Tuesday	Study day (No class)		
May 3 <sup>rd</sup> – Thursday	Study day (No class)		
May 8 <sup>th</sup> – Tuesday	Exam week (No class)		
May 10 <sup>th</sup> – Thursday	<b>Final exam (tentative)</b> (9 a.m. - noon)		