


Introduction to Neuroscience



Department of Psychology & Neuroscience

11:15-12:05, MWF

Fall 2018

PSYC 175 – Course Syllabus

Instructor
Dr. Marsha Penner
mpenner@email.unc.edu

Office Hours: Please use the Sakai 'Sign-up' tool to reserve a time slot

Office location: Davie Hall 237

Instructional Assistants

Stephanie Langella: Office
Location Davie Hall 349

Kent Lee: Office Location
Davie Hall 307

Ethan McCormick: Office
Location Davie Hall 209

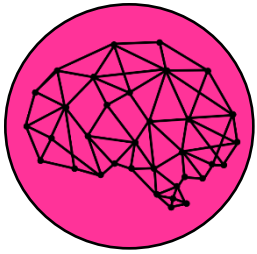
Shaina Roth: Office Location
Davie Hall 364B

Contacting us with your questions: We are going to use a course Piazza site. This site allows you to send private messages to your IAs, and you can also pose general questions to the class regarding course content or logistics. Using this tool allows us to respond to common questions for all to see. We tend to hear similar questions often. By checking in at the Piazza site, and asking your questions there, we can ensure that you get a response quickly. Often other students in the class have the answers you need, and will respond quickly. See the Sakai site for instructions to access the site.

If you have questions that you would prefer to communicate via email, please use the 'Message' tool on the Sakai site to ensure that you get the quickest response (use the dropdown menu to select 'Instructor role' as recipient).

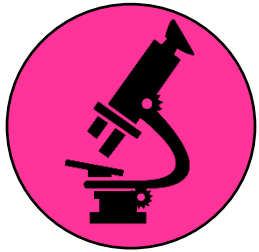
Office hours: Please use the "Sign up" tool on Sakai to book your very own time slot! This alerts us that YOU are coming to office hours, allowing us to prepare for your booked time (e.g., pull your exams to look at). It will also help us get to know you and associate a face with a name! Finally, the sign up tool also allows us to contact you personally, should we need to re-schedule in case of an emergency.

COURSE DESCRIPTION



Neuroscience is a field that seeks to understand the structure and function of the nervous system and brain. This course is intended for undergraduate students interested in understanding the molecular, cellular, behavioral, and computational mechanisms of the brain. Prerequisite: PSYC 101

COURSE GOALS



This course will provide you with the basic language and concepts for the field of Neuroscience. We will be covering Neuroscience broadly so that you can appreciate the wide variety of topics that Neuroscientists pursue, as well as the methods that Neuroscientists use in the laboratory. The foundational knowledge you gain in this course will prepare you for upper level classes in Neuroscience where you will be able to take a deeper look at particular Neuroscience topics that interest you. In order to get the most out of your neuroscience classes (including this one!), you should be striving to make connections between the topics that we cover at the beginning, middle, and end of the semester through practice and participation. This will set you up for success in other Neuroscience classes!

COURSE OBJECTIVES

Upon completion of PSYC 175, students should be able to:

- Describe methods used in neuroscience research
- Describe the cellular and gross anatomy of the nervous system
- Predict how damage to the central nervous system affects function and behavior
- Explain how neurons communicate
- Compare and contrast neurotransmitter systems in terms of organization and function
- Predict what happens to function and behavior when neurotransmitter systems are blocked or activated
- Compare and contrast the organization and function of multiple sensory systems
- Explain the importance and usefulness of animal models in neuroscience
- Describe the neural basis of emotions, aggression, stress, and anxiety and affective disorders
- Explain how the brain regulates sleep and wakefulness
- Describe the neurobiological basis of learning, memory and memory disorders (e.g., Alzheimer's disease)

This is an active learning class!

We are going to use class time engaging in active-learning activities (e.g. problem-solving, discussion, etc.). Important concepts will be introduced via the pre-assigned readings and short videos. During class you will come prepared to use what you have learned by putting larger conceptual ideas together. This approach is a lot more fun than sitting passively listening to me lecture! And besides being fun, you will have many opportunities in class to work through concepts that are giving you trouble. This means that you will need to make sure you come to class prepared to be an active learner. An abundance of research clearly demonstrates that this method of learning is more effective than a traditional lecture-based class. Regular attendance and class participation are expected. You are responsible for your attendance and for any information you miss by not attending class.

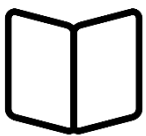
You can prepare for class by following these steps

1. Complete the assigned readings, assignments, and videos *before* class.
2. Do the timed online quizzes to assess your reading comprehension.
3. Identify the concepts that you are having difficulty with so that you can work through these concepts with me, your IAs, and your peers. *Please remember that we are all here to make sure that you succeed in this class!*

WHAT YOU SHOULD BRING TO CLASS EVERY DAY:

1. A laptop or notebook for note taking. *Note: educational research shows that students learn more by handwriting notes!*
2. Extra blank paper for drawings, notes, activities etc.
3. 3 x 5 index cards.
4. Your laptop/tablet/smartphone enabled for UNC wi-fi access.

COURSE RESOURCES



Required Textbook:
Neuroscience: Exploring the
Brain



Quizzes, assignments, etc can be found
on the course Sakai site:
<https://sakai.unc.edu/>



Have a question? Check the Piazza site! Someone else may have already posted that very question!

For fun!

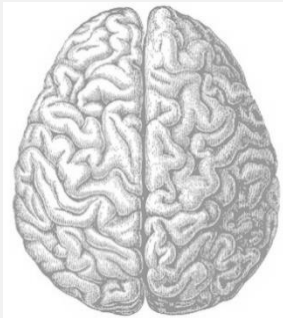


Facebook: search group page
'Introduction to Neuroscience'



Twitter: @awesomeneuron

How is my final grade determined?

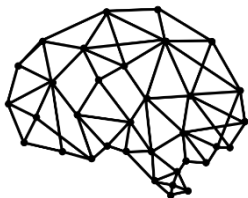


- 3%** = PollEverywhere, In-class assignments and Peerwise (lowest 20% of your grade will be dropped)
- 12%** = Online Quizzes (drop 3 lowest scores)
- 20%** = Writing Assignments (complete 4 of 11 assignments)
- 35%** = Exams (3 in total, drop lowest score)
- 30%** = Cumulative Final Exam

The quizzes, exams, assignments, and activities that you will complete in this class are carefully designed to optimize your learning. I use an evidence-based approach when designing classes. This means that I use learning approaches based on scientific evidence that demonstrates the effectiveness of these approaches.

Overall, my aim is to help you progress through Bloom's taxonomy of learning such that you are analyzing, evaluating, and creating information.

Not only is this a lot more fun than memorizing, but you will also be more likely to retain the information!



PollEverywhere, In-class assignments, and Peerwise: Points will be earned during class time using PollEverywhere (<https://pollev.com/neurons>). For the first two weeks of class, a response to the Poll will earn one participation point. After that, a correct response to the Poll will continue to earn one point, and an incorrect response will earn half a point. Please remember to register for PollEverywhere, as unregistered responses cannot earn points.

We may also assign other in-class assignments to deepen your understanding of course materials, such as case studies or thought questions from your readings. Some of these assignments will be turned in during class time and graded, or assigned as homework for grading. The lowest 20% of your in-class assignment grade will be dropped. **This makes it unnecessary to contact us when you will be absent, forgot to hand something in, or miss an in-class assignment for another reason.**

We will also be using Peerwise to deepen your understanding of course material. On the Peerwise site, you will write multiple choice questions, and answer and evaluate questions posted by your peers. Research shows that writing test questions is an effective study tool - it requires that you understand the material, and you will begin to anticipate what kinds of questions are likely to appear on the exam. In fact, some questions that appear on each exam may come directly from Peerwise! Start by visiting PeerWise here (or click on the Peerwise tab on the course Sakai page): http://peerwise.cs.auckland.ac.nz/at/?unc_edu. If you have not used PeerWise before, just click the "Registration" link and follow the prompts. All you need to do is choose a user name and a password for your PeerWise account. If you have used PeerWise before, simply log in and then

select "Join course" from the Home menu. To access our course, "PSYC 175 Fall 2018", you will need to enter two pieces of information: 1) Course ID = 17655 2) Identifier = Please enter your Onyen. You will post 3 questions, and answer 3 questions prior to each mid-semester exam (Exams 1, 2, 3) and on the last day of class. By the end of the semester you should have submitted 12 questions, and answered/evaluated 12 questions. You will be graded as follows: 'A' 12 questions posted, 12 question answered and evaluated; 'B' 10 questions posted, 9 questions answered and evaluated; 'C' 8 questions posted, 6 questions answered and evaluated; less than 8 questions posted and evaluated will earn a '0'.



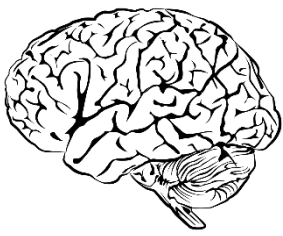
Quizzes: Online timed quizzes will be used as a study tool and to assess your learning. These quizzes will help you keep abreast of your reading for the class, and will help you determine if you took away key concepts from the reading. As you read your textbook, take notes in your own words to prepare for the quizzes. Quizzes are due *prior* to the relevant class, closing 1 hour before class begins. Quizzes will include 10 multiple choice questions. *Your lowest 3 quiz scores will be dropped so that you need not worry if you register late, forget to take a quiz, your computer crashes, you get sick, or you lose a wifi signal. Because you can drop your three lowest scores, make up quizzes will not be administered.* **Tip:** Although you are allowed to use your textbook and notes when you take the online quizzes, I recommend that you do them without guidance. The quizzes are meant to serve as a diagnostic tool to help you determine if you understand what you read.



Writing Assignments: Extra readings outside of the textbook will be used to deepen your understanding of course materials. There are 11 papers due over the course of the semester. **Out of these 11, you must complete at least 4.** You can choose which papers you would like to complete, but I recommend that you *do not* leave all of your papers to the end of the semester. Consult the course schedule (below) to view the topics for the papers. In the 'Unit' tool on Sakai you can access the paper (check the syllabus to find the correct 'Unit'). Additional instructions and a rubric can be found on Sakai. A few policies to note:

- a. Because there are MANY deadlines, there are NO EXTENSIONS for any reason.
- b. No emailed or hardcopy papers will be graded. You must submit your work on Sakai.
- c. Submit your assignments to the correct assignment link. We will only grade assignments that have been submitted to the correct link by the deadline.
- d. Plagiarism is an Honor Code Violation that we are required to report. I have uploaded a document in 'Resources' on the Sakai site that outlines what is considered plagiarism and what steps you can take to avoid it.

Extra Credit Assignments: These are found on Sakai with instructions. There are NO EXTENSIONS for extra credit assignments under any circumstances. These must be submitted to Sakai, under the correct link, by the deadline (see the Sakai calendar) – no exceptions.



Exams: There will be 3 in-class exams, and a cumulative final exam. Each in-class exam will cover assigned materials since the previous exam. Exams will consist of multiple choice questions.

Because you will be able to drop your lowest exam score (excluding the final exam), make-up exams will not be administered. Note that the final exam is weighted more heavily than the mid-term exams, reflecting the fact that it will be cumulative. If you do miss an exam during the regular semester, please come see one of us to go over the missed exam so that you can learn from it and are prepared for the final. **Final Exam**

Schedule: We are required to have our final exam on Tuesday, **December 12** at

12:00pm. If you have two exams at the same time or three exams within 24 hours and you want to reschedule the exam, please see an academic advisor for an exam excuse form. **The alternate exam date is Saturday, December 9th at 8am.**

Letter Grade Assignments

A = 94-100	B- = 80-83	D+ = 67-69
A- = 90-93	C+ = 77-79	D = 60-66
B+ = 87-89	C = 74-76	F = 0-59
B = 84-86	C- = 70-73	

* Final grades are rounded (.4 down and .5 up). For example 89.4 = 89/B+; 89.5 = 90/A-.

What do these grades mean?



Here is an explanation of grades from the Undergraduate Bulletin (<http://www.catalog.unc.edu/policies-procedures/attendance-grading-examination/>):

- A Mastery of course content at the highest level of attainment** that can reasonably be expected of students at a given stage of development. The A grade states clearly that the student has shown such outstanding promise in the aspect of the discipline under study that he/she may be strongly encouraged to continue.
- B Strong performance demonstrating a high level of attainment** for a student at a given stage of development. The B grade states that the student has shown solid promise in the aspect of the discipline under study.
- C A totally acceptable performance demonstrating an adequate level of attainment** for a student at a given stage of development. The C grade states that while not yet showing any unusual promise, the student may continue to study in the discipline with reasonable hope of intellectual development.
- D A marginal performance in the required exercises demonstrating a minimal passing level of attainment** for a student at a given stage of development. The D grade states that the student has given no evidence of prospective growth in the discipline; an accumulation of D grades should be taken to mean that the student would be well advised not to continue in the academic field.
- F For whatever reasons, an unacceptable performance.** The F grade indicates that the student's performance in the required exercises has revealed almost no understanding of the course content. A grade of F should warrant questioning whether the student may suitably register for further study in the discipline before remedial work is undertaken.

ACADEMIC INTEGRITY

All work that you do for this class must be completed according to the UNC Honor Code. You will maintain confidentiality of examinations. It is your responsibility to speak with your Professor if you are not sure what constitutes plagiarism or have any questions about the Honor Code. If you have not done so previously, please review the academic code at UNC at http://integrity.unc.edu/hc_handout.html. All suspected cases of academic misconduct must be reported to the Office of the Dean of Students, and thus we are compelled to do so if we suspect academic misconduct of any kind.



DIGITAL ETIQUETTE



It will be necessary to use a digital device during class time. Please be respectful of your classmates and restrict your use to course content. Hopefully it will never come to this – but we will ask you to put your device away for the rest of the class, and you will forfeit your participation points for that day if you chose to distract your peers during class time. Your behavior affects everyone around you: I have sat in the back of my classroom and was unable to concentrate because of the distractions on computer screens throughout the classroom. We are all working as a learning team in class, and we're only as awesome as our weakest link! Don't let it be you!

OTHER RESOURCES ON CAMPUS

The Writing Center is a wonderful resource to use if you need some help with your writing and editing skills, and The Learning Center would love to coach you – they have excellent coaching opportunities for things like time management, study skills, and goal setting. Give them a try!



If you experience difficulty during the semester that interferes with your ability to come to class or complete your work, including difficulty securing food or housing, or stress and mental health issues, I urge you to contact the Office of the Dean of Students (in person or by phone 919-966-4042) or Counseling and Psychological Services (in person or by phone 919-966-3658). If you see that someone in our class is struggling, please let us know. We are a learning community and can help each other be successful.

If you require an accommodation, please contact the Office of Accessibility and Resources. If you have accommodations to take exams at the Office of Accessibility Resources, please let me know as soon as possible.



A note from Dr. Penner... I want you to succeed in this class! You belong here and deserve to be here! I believe that students can THRIVE when: they take full advantage of the breadth and depth of our curriculum, they set academic and personal goals, and are empowered to take responsibility for their education, choices, and decisions.

thrive
@CAROLINA

NSCI 175: Introduction to Neuroscience
 Department of Psychology & Neuroscience
 Fall 2018 Schedule
 MWF 11:15-12:05
 Hanes Art Center 121

Below is an outline of the class. On Sakai, you will also find each Unit listed on the sidebar under the 'Units' tab. In each Unit you will find your learning objectives, links to quizzes and writing assignments, videos, and any other resources (e.g., supplemental readings, problem sets, worksheets) you might need to prepare for class, or that you should complete after class. We will assign in-class assignments and homework and will post these assignments on Sakai after we have introduced them in class.

You should always refer to the syllabus and the 'Unit' tool on Sakai when you are preparing for class.

***Changes to the Syllabus:** If changes to the schedule become necessary, I will announce this in class or post an announcement on Sakai. It is your responsibility to check in on Sakai and check your UNC email account regularly.

Date	Topic	<u>Readings, videos, and other activities to do <i>before class</i>.</u> Please check the Unit tool on Sakai in case there are worksheets or other homework assignments. Please look at the boxes in your textbook! They highlight cool stuff!
W 08/22 Quiz 1	Welcome! Please have a good look at the syllabus before you come to class!	<ol style="list-style-type: none"> 1. Please read the syllabus carefully, and have a look at the course Sakai site 2. Complete Quiz 1 (it is based on the syllabus) on Sakai.
Unit 1		
F 08/24 Quiz 2	<u>Neuroscience: Past, Present, and Future I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 1 pp. 4-14 (Chapter 1 from the Bear textbook is uploaded to the Sakai site and is found in Unit 1). 2. Watch videos on Sakai 3. Identify at least one neuroscientist at UNC who does: molecular, cellular, systems, behavioral, and cognitive neuroscience. <i>Bring your list to class.</i>
M 08/27 Quiz 3	<u>Neuroscience: Past, Present, and Future II</u> <u>The Importance of Animal Models in Neuroscience</u>	<ol style="list-style-type: none"> 1. Read textbook: Ch 1 p. 14 to end of chapter 2. Watch videos on Sakai 3. Read the information about animal use here (links also found on Sakai): http://bnpsych.unc.edu/animal-use/ 4. And here (click on the animal icons across the top to navigate through the information): http://www.brainfacts.org/about-

		neuroscience/animals-in-research/articles/2012/animal-models/
Unit 2		
W 08/29 Quiz 4	<u>Neurons and Glia I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 2 pp. 23-46 2. Read about Cajal and Golgi: http://www.visionlearning.com/en/library/Inside-Science/58/Santiago-Ram%C3%B3n-y-Cajal-and-Camillo-Golgi/233 3. Watch videos on Sakai
F 08/31 Quiz 5	<u>Neurons and Glia II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 2 p. 46 to end of chapter 2. Watch videos on Sakai
M 09/03	Labor day – No classes	
Unit 3		
W 09/05 Quiz 6	<u>The Resting Membrane Potential</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 3 – don't forget to study Box 3.2 and 3.3 2. Watch video(s) on Sakai 3. Launch the Nernst/Goldman Equation Simulator: http://www.nernstgoldman.physiology.arizona.edu/ 4. Complete the worksheet found on Sakai and bring it with you to class
Unit 4		
F 09/07 Quiz 7	<u>The Action Potential I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 4 pp. 82-99 – don't forget boxes 4.1, 4.2, 4.3 2. Watch video on Sakai
M 09/10 Quiz 8	<u>The Action Potential II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 4 p. 99 to end of chapter 2. Watch video(s) on Sakai
Unit 5		
W 09/12 Quiz 9	<u>Synaptic Transmission I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 5 pp. 110-132 2. Watch video(s) on Sakai
F 09/14 Quiz 10	<u>Synaptic Transmission II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 5 p. 132 to end of chapter 2. Watch video(s) on Sakai
Unit 6		
M 09/17 Quiz 11	<u>Neurotransmitter Systems I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 6 pp. 143-163 2. Watch video(s) on Sakai

W 09/19 Quiz 12	<u>Neurotransmitter Systems II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 6 p. 163 to end of chapter 2. Watch video(s) on Sakai
Unit 7		
F 09/21 Quiz 13	<u>The Structure of the Nervous System I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 7 pp. 179-191; Pay attention to Box 7.2 & 7.3; Table 7.1 and 7.2 2. Look at textbook Ch 7 Appendix. Focus on 'surface anatomy of the brain'; 'cross-sectional anatomy' to p. 237; and cranial nerves on pp. 246-247. 3. Watch videos on Sakai
M 09/24 Quiz 14	<u>The Structure of the Nervous System II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 7 pp. 205-215 (beginning at 'Special features of the human CNS') 2. Watch video(s) on Sakai
W 09/26 Peerwise due	EXAM 1 (Units 1-7)	
Unit 8		
F 09/28 Quiz 15	<u>The Chemical Senses I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 8 pp. 266-278 2. Watch video(s) on Sakai
M 10/01 Quiz 16	<u>The Chemical Senses II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 8 p. 278 to end of chapter 2. Watch video(s) on Sakai
Unit 9		
W 10/03 Quiz 17	<u>The Eye</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 9 2. Watch video(s) on Sakai
Unit 10		
F 10/05 Quiz 18	<u>The Central Visual System I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 10 pp. 332-347 2. Watch video(s) on Sakai
M 10/08 Quiz 19	<u>The Central Visual System II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 10 p. 347 to end of chapter 2. Watch video(s) on Sakai
Unit 11		
W 10/10 Quiz 20	<u>The Somatic Sensory System I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 12 pp. 415-437 2. Watch video(s) on Sakai

F 10/12	University Day – Class cancelled	
M 10/15 Quiz 21	<u>The Somatic Sensory System II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 12 pp. 437-452 2. Watch video(s) on Sakai
Unit 12		
W 10/17 Quiz 22	<u>Spinal Control of Movement I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 13 pp. 453-468 2. Watch video(s) on Sakai
F 10/19	Fall Break – No classes	
M 10/22 Quiz 23	<u>Spinal Control of Movement II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 13 p. 468 to end of chapter 2. Watch video(s) on Sakai
Unit 13		
W 10/24 Quiz 24	<u>Brain Control of Movement I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 14 pp. 483-498 2. Watch video(s) on Sakai
F 10/26 Quiz 25	<u>Brain Control of Movement II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 14 p. 498 to end of chapter 2. Watch video(s) on Sakai
M 10/29	EXAM 2 (Units 8-14)	
Unit 14		
W 10/31 Quiz 26	<u>Chemical Control of Behavior I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 15 pp. 521-538 2. Watch video(s)
F 11/02 Quiz 27	<u>Chemical Control of Behavior II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 15 p. 538 to end of chapter 2. Watch video(s) on Sakai
Unit 15		
M 11/05 Quiz 28	<u>Motivation I</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 16 pp. 551-566 2. Watch video(s) on Sakai
W 11/07 Quiz 29	<u>Motivation II</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 16 p. 566 to end of chapter 2. Watch video(s) on Sakai
Unit 16		
F 11/09 Quiz 30	<u>Brain Mechanisms of Emotion</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 18 2. Watch video(s) on Sakai
M 11/12	<u>An Animal Model of PTSD</u>	<ol style="list-style-type: none"> 1. Watch the video on Sakai
Unit 17		
W 11/14 Quiz 31	<u>Mental Illness</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 22 2. Watch video(s) on Sakai
Unit 18		
F 11/16	<u>Brain Rhythms and Sleep</u>	<ol style="list-style-type: none"> 1. Read textbook Ch 19

Quiz 32		2. Watch video(s) on Sakai
Unit 19		
M 11/19 Quiz 33	<u>Memory Systems I</u>	1. Read textbook Ch 24 pp. 823-841 2. Listen to Radiolab podcast "On repeat" starting at min 6:25 http://www.radiolab.org/story/161754-repeat/
W 11/21	Happy Thanksgiving! No classes	
F 11/23	Happy Thanksgiving! No classes	
M 11/26 Quiz 34	<u>Memory Systems II</u>	1. Read textbook Ch 24 p. 841 to end of chapter 2. Listen to Radiolab podcast "Adding Memory" http://www.radiolab.org/story/91573-adding-memory/
W 11/28 Peerwise due	EXAM 3 (Units 15-20)	
Unit 20		
F 11/30 Quiz 35	Molecular Mechanisms of Learning I	1. Read textbook Ch 25 pp. 865-891 2. Watch video(s) on Sakai
M 12/03 Quiz 36	Molecular Mechanisms of Learning II	1. Read textbook Ch 25 p. 891 to end of chapter 2. Watch video(s) on Sakai
W 12/05 Peerwise due	Wrap up, course evaluations, and farewell!	

Final Exam: Tuesday December 12th, 12:00 pm