

BIO 208 – Cell, Brain and Mind (Spring 2018)

Tu/Th 10:00- 11:20 AM

Frey Lecture Hall, Room 104

Please read this document carefully. It contains important course information and course policies.

Instructors: Dr. Lorne Mendell (Course Director) and Dr. Craig Evinger, Department of Neurobiology & Behavior

Course Philosophy: Neuroscience investigates all aspects of the brain and nervous system. The goal of this course is to help you understand how your brain functions so that you can see how it explains much of your behavior. By learning about your brain, you can also understand what happens when the brain doesn't function correctly. In addition, we will discuss how new discoveries about the brain will impact health care and change our lives in the future.

Course Objectives: This course is designed to introduce students who are not BIO majors to the Fundamentals of Brain Science. Students will gain insight into numerous aspects of brain function and prepare themselves to understand and discuss new findings in Neuroscience reported by the popular press. By the end of the course students will:

- a) Be able to identify different parts of the brain and understand how it develops from a single cell into the most complicated organ in the body (Lectures 1, 2, 18, 19)
- b) be able to explain how neurons are specialized to transmit information (Lecture 3)
- c) understand how the nervous system converts physical stimuli into sensation (Lectures 4, 5, 6, 7, 10, 11, 25)
- d) be able to describe how the brain enables us to move (Lectures 5, 9, 13, 14, 15, 16)
- e) be able to describe mechanisms of how the brain repairs itself and medical interventions to repair or compensate for brain injury (Lectures 16, 19)
- f) understand how the brain determines sleep wake cycles and emotions (Lectures 21, 22 and 28)
- g) be able to explain brain mechanisms of higher function: consciousness, learning, memory, decision making, language, and music (Lectures 7, 12, 20, 22, 23, 26)

2018 BIO 208 Lecture Schedule (subject to modification)

Class #	Date	Day	Lecturer	Title
1	Jan. 23	Tuesday	Evinger	Why do we have a brain & How much brain does it take to catch a ball?
2	Jan. 25	Thursday	Evinger	How neurons communicate: the neural code
3	Jan. 30	Tuesday	Mendell	Brain structure: the flow of information in the brain
4	Feb. 1	Thursday	Mendell	Wiring the brain: establishing the “color” code
5	Feb.6	Tuesday	Mendell	Coding input from the skin: the sensory code
6	Feb. 8	Thursday	Mendell	Muscle activation: the motor code
7	Feb. 13	Tuesday	Mendell	The gain in pain lies mainly in the brain; pain treatments and addiction
8	Feb. 15	Thursday	Exam 1	Covers Material from lectures 1-7
9	Feb. 20	Tuesday	Mendell	Auditory coding: making sense of simple and complex sounds
10	Feb. 22	Thursday	Evinger	Visual disorders and illusions for which the eyeball is responsible.
11	Feb. 27	Tuesday	Evinger	How the brain interprets information from the eyeball & Replacing the eyeball with a machine.
12	March 1	Thursday	Evinger	How paying attention to what we see enables magicians to make a living.
13	March 6	Tuesday	Evinger	How the brain uses eye movements to explore the world, yet keeps the visual world from appearing to move.
14	March 8	Thursday	Evinger	What is Parkinson’s disease and why does electrically stimulating the brain improve function in patients with Parkinson’s disease?
	March 13	Tuesday		Spring Break
	March 15	Thursday		
15	March 20	Tuesday	Evinger	Using your brain to control machines.
16	March 22	Thursday	Evinger	What part of the brain does a field sobriety test examine?
17	March 27	Tuesday	Exam 2	Covers material from lectures 9-16
18	March 29	Thursday	Mendell	The Genetic code and brain function
19	April 3	Tuesday	Mendell	Repairing the injured brain and spinal cord
20	April 5	Thursday	Mendell	Neural mechanisms of learning and memory: classical conditioning; mirror cells: learning by imitation; memory systems; place cells
21	April 10	Tuesday	Mendell	Conscious behavior; reduced levels of consciousness; subconscious behavior; Blind sight;
22	April 12	Thursday	Mendell	Sleep; Brain rhythms from milliseconds to hours; Dreaming; functional aspects of sleep
23	April 17	Tuesday	Mendell	Brain and society: decision making, ethical behavior, free will?
24	April 19	Thursday	Exam 3	Covers Material from lectures 18-23
25	April 24	Tuesday	Evinger	Why house cats are legally blind.
26	April 26	Thursday	Evinger	How the brain learns a language.
27	May 1	Tuesday	Evinger	The amygdala and fear.
28	May 3	Thursday	Evinger	Dopamine and pleasure.
	May 11	Friday 11:15 AM -1:45 PM		Final Exam (Cumulative exam on the entire course with emphasis on material covered in lectures 25-28)

*All lectures will be posted on Blackboard prior to the lecture. Links to websites that contain supplementary reading material also will be posted. Lectures will be available on the ECHO site shortly after the lecture. **There is no required text for this course. See below for additional readings if desired.**

As a courtesy to your fellow students and the instructor – Please be on time for class.

All lectures will be recorded in full using Echo360 and made available on the web, linked through Blackboard. **We emphasize that we cannot guarantee that each lecture will be recorded successfully. There can be technical problems with such recordings and/or web access to them. Indeed, technical problems are likely to occur based on past experience. Technical failures of the Echo system or problems with web access will not be considered a valid excuse for lack of student preparation for exams, or for poor exam performance. Therefore, students should not count on the recorded lecture as a replacement for the live version.**

You are responsible for the material given in lectures as well as what will be posted on Blackboard by each lecturer. This material includes the images used by the lecturer on Blackboard as well as drawings made in class to explain points made during lecture. You are *not* responsible for Supplementary Reading Material (See Resources for BIO 208 below) unless specifically assigned by the lecturer.

Course Faculty:

Course Director,

Dr. Lorne Mendell, 532 Life Sci Bldg, 632-8632; Lorne.Mendell@stonybrook.edu

Office Hours: Tuesday 1:30- 3:00 PM

Wednesday 3:30- 5:00 PM

Other times by appointment

Dr. Craig Evinger, 521 Life Sci Bldg, 632-8643, leslie.erving@stonybrook.edu

Office Hours: Tuesday 2 – 3:30PM

Wednesday 10 – 11:30PM

Other times by appointment

Ms Hannah Wu, hannah.wu@stonybrook.edu

Access to BIO208 Blackboard site

You can access class information on-line at: <http://blackboard.stonybrook.edu>. If you used Stony Brook's Blackboard system previously, your login information (Username and Password) has not changed. If you have never used Stony Brook's Blackboard system, your initial password is your SOLAR ID# and your username is the same as your Stony Brook (sparky) username, which is generally your first initial and the first 7 letters of your last name.

For help or more information see:

<http://www.sinc.stonybrook.edu/helpdesk/docs/blackboard/bbstudent.php>. For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

Exam policy:

All exams will be given in Javits 102, the site of the lectures. Please be sure to note the times for each exam including the FINAL. No early exams will be given to accommodate Holiday travel nor will makeups be given *without documented medical or hardship excuses*. If you have a valid excuse for missing any of the three midterm exams, you may take a makeup exam, which will be in an **essay and/or short answer format**, and given following the final exam. Note: The final exam is compulsory and should take only 1 hour and 20 minutes, a normal class period, allowing time for makeup exams.

You can also choose not to take the makeup for the midterm exam that you missed if you are satisfied with your grades from two of your midterm exam results because we drop your lowest midterm exam grade. **The Final Exam is compulsory.**

Cell phones and electronic dictionaries are not permitted during any exam! Use of ANY electronic device will be considered as an act of Academic Dishonesty and treated as such.

Attendance at exams:

Any person arriving late to an exam will not be able to take the exam if one of the other students has already finished and left the exam room. *This includes the final exam.* As some students finish the exams quickly, you should arrive on time for the start of the exams.

Problems with exam questions:

After the exam, you will be able to take the question page with you and the answers will be posted on Blackboard. Dissatisfaction with any exam question may be submitted in writing via e-mail to Dr. Mendell within 24 hours after the answers are posted. No appeals will be accepted after this 24-hour period. This is your opportunity to indicate questions that you think are ambiguous or unfair. If your criticisms are justified in the judgment of the faculty, credit will be given for acceptable answers.

Grading:

The three mid-term, in class exams and the final exam will consist primarily of multiple choice questions, drawn exclusively from the material covered in lectures. For your final grade, we will use the two **highest** scores from your three mid-term exams. Each of these will count 33% of your final overall score. The final exam (Compulsory) will count the remaining 34% of the overall score. The final exam will be cumulative (i.e., cover material over the entire course), but will have extra emphasis on the four lectures at the end of the course, after Exam 3. The exact number of questions based on those lectures will be announced prior to the final exam. Final letter grades will be assigned based on the overall score calculated as described above and rounded to the nearest whole percent. **No appeals of final letter grades or requests for additional work to improve your grade will be considered.**

Resources for Bio 208 –Course background on neurons and the brain may be found in any Introductory Biology Text.

If you're looking for additional information, the following websites are useful:

1. From the Society for Neuroscience, Brain Facts: <http://www.brainfacts.org/> This site is a collection of links that provide information on all aspects of Neuroscience research and neural diseases.
2. The Dana Foundation website is a gateway to information on Neuroscience research <http://www.dana.org/>
3. Neuroscience for Kids: <http://faculty.washington.edu/chudler/neurok.html> This site is primarily for elementary and secondary school students, but has a wealth of straight forward information to get you started when tackling a new subject.
4. Michigan State University <https://www.msu.edu/~brains/brains/human/index.html> or the University of Utah <http://library.med.utah.edu/kw/hyperbrain/index.html> sites allow you to scan through the human brain.
5. The Kalvi Foundation <http://www.kavlifoundation.org/neuroscience> website is also a gateway to Neuroscience information
6. Textbooks on reserve in Melville Library: TBD

Additional readings: Many books appropriate for non specialists that describe different aspects of neuroscience are available to broaden your knowledge of the subject. A partial list is below.

- 1) *Best of the Brain from Scientific American*, ed. Floyd E. Bloom, Dana Press, 2007
- 2) *Phantoms in the Brain*. VS Ramachandran and Sandra Blakeslee. William Morrow and Company 1998
- 3) *The Neuroscience of Fair Play*, Donald W. Pfaff, Dana Press, 2007
- 4) *This is Your Brain on Music*, Daniel J. Levitin Penguin, 2007
- 5) *Musicophilia*, Oliver Sacks, Vintage Press, 2008
- 6) *Descartes Error*, Antonio R. Damasio, Avon Books, 1995
- 7) *The Ethical Brain*, Michael Gazzaniga, Dana Press, 2005
- 8) *Synaptic Self*, Joseph LeDoux, Viking Press, 2002
- 9) *The Man Who Mistook His Wife for a Hat* Oliver Sacks, Touchstone Books, 1998
- 10) *The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science* Norman Doidge, Penguin Books, 2007
- 11) *In Search of Memory: The Emergence of a New Science of Mind*, Eric R Kandel, WW Norton, 2006

DISABILITY SUPPORT SERVICES (DSS) STATEMENT

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities/asp>.

ACADEMIC INTEGRITY STATEMENT

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instance of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Critical Incident Management

Stony Brook University expects students to maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people