BISC-230xg, **Biology of the Brain**

Fall Semester 2018

Course Description: This is a GE course (D, Life Sciences) designed for non-science majors and is not available for major credit. Topics to be considered include the structure and function of the brain of humans and other animals including the role of the brain plays in regulating a range of behaviors.

Learning Objectives: After completing this course, students will have a clear understanding of how neurons function and how they control a variety of perceptions and behaviors.

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Laboratory Director: Michael Moore; moore@college.usc.edu
Office: 371B ZHS; 740-6084

Teaching Assistants: TBA

Blackboard:
https://blackboard.usc.edu

Textbooks (recommended, not required):
(MM): *The Mind's Machine* by Watson and Breedlove, 2nd edition.
Publisher: Sinauer. ISBN: 9780878939336.
(SP): *Sensation and Perception* by Wolfe *et. al.*, 5th edition.
Publisher: Sinauer ISBN: 9781605352114

Lectures: MWF 12:00-12:50 PM, ZHS 252

PowerPoint slides of the lectures will be posted to Blackboard in advance of each class meeting. The contents of these slides will be drawn largely from the textbook readings but may also contain information from other sources. A successful learning strategy is to read over the lecture notes before class so that class time can be efficiently spent learning the material in greater depth.

Grading (there is no "extra credit" so please, don't ask):

Lecture Exam 1 (Monday, September 17)	75 points
Lecture Exam 2 (Friday, October 12)	75 points
Lecture Exam 3 (Monday, November 5)	75 points
Final Exam (Friday, December 7; 11AM-1PM)	175 points
(75 points for Exam 4 plus 100 points cumulative)	
Laboratory (see lab schedule below for point breakdown)	100 points
Total	500 points

Lecture Exams:

There will be four in-class exams that will consist of a mix of short-answer, multiple choice, true/false, fill-in-the-blank and matching type questions. Exams will cover information given in lectures only; laboratory performance will be covered separately in the labs (see below). The final exam will cover material since the third exam and will also have a cumulative portion covering the entire course. If you arrive late for an exam and another student has already finished their exam and left the exam room you will not be permitted to take the exam and will receive a score of zero for that exam.

Pass/No Pass Policy:

Students taking this course with the Pass/No Pass option must have a final score equivalent to "C minus" or better to receive a "Pass." "No Pass" will be assigned for final scores less than the equivalent of a "C minus."

Re-Grading of Exams:

If you wish to have one or more exam questions re-graded you must submit a *written* request within one week of when your exam was returned to you. The entire answer will be re-graded, not just the part you think deserves more credit. Your score may go up or down as a result of a re-grade.

Missed Exams:

No make-up exams will be given. Students who are unable to take an exam at the scheduled time must give written notification as soon as possible, preferably in advance. Students who miss an exam, assignment, quiz, etc. for a legitimate reason (either a medical issue or a University-sanctioned event) must provide written documentation of said reason within seven days of the exam or assignment due date. Documentation must be sent to Dr. Moore. If documentation is not received within seven days the score for the missed assignment will be a zero. Upon receipt of valid documentation, the score for the missing assignment will be prorated. In other words, the score for the missed assignment will be the average of the score for the other like assignments. (For example, if exam 2 is missed, that score will become the average of exams 1, 3, and 4). Note that proration will only be done for one missed exam. This policy does not apply for the Final Exam which cannot be missed.

Final Grade Determination:

Grades will be assigned on a curve, based on the total number of points earned in the course. After each exam a curve will be given by the instructors to indicate roughly what letter grade corresponds to students' current number of points. Specifically, you will be provided with the current course average and a provisional letter grade scale. Please remember that the course mean provided on Blackboard is provisional as it is based on the number of points possible at that point in the course. Only the total number of points earned by the end of the semester will determine course grades.

Lecture Schedule:

Lecture #	Date	Topic	Reading
1	8/20	Introduction to and overview of the course	
2	8/22	How did we get here? (Evolution of the brain)	MM: Chapter 1
3	8/24	What's up there between our ears? (Structure and organization of the nervous system I.)	MM: Chapter 2 SP: Chapter 1
4	8/27	The most complicated structure in the known universe. (Structure and organization of the nervous system II.)	MM: Chapter 2 SP: Chapter 1
5	8/29	What exactly is that three pounds of flesh? (Cells of the nervous system.)	MM: Chapters 2, 13 SP: Chapter 1
6	8/31	…and how did it get that way? (Development of the nervous system.)	MM: Chapters 2, 13 SP: Chapter 1
	9/3	*University Holiday (Labor Day)*	
7	9/5	The brain is cordless and rechargeable. (Electrical properties of neurons.)	MM: Chapter 3 SP: Chapter 1
8	9/7	Neurons signal faster than you can drive. (Neurophysiology)	MM: Chapter 3; SP: Chapter 1
9	9/10	Some neurons are faster than others. (The importance of myelination.)	MM: Chapter 3; SP: Chapter 1
10	9/12	Neurons have their own language (Synaptic transmission)	MM: Chapter 4
	9/14	Review for Exam 1	
	9/17	**Exam 1, 75 points (covers lectures 1-10)**	
11	9/19	Brains are a bit like computers. (Synaptic summation and integration.)	MM: Chapter 4
12	9/21	Don't touch that! (The somatosensory system.)	MM: Chapter 5 SP: Chapter 13
13	9/24	I can't hear you… (Sound and hearing I)	MM: Chapter 5 SP: Chapter 9,10
14	9/26	Say what? (Sound and hearing II)	MM: Chapter 5 SP: Chapter 9,10
15	9/28	Speed up, I can't tell we're even moving! (The vestibular system.)	MM: Chapter 5 SP: Chapter 12
16	10/1	Why rollercoasters are so much fun. (The vestibular system II.)	MM: Chapter 5 SP: Chapter 12
17	10/3	What *is* that smell? (Olfactory system)	MM: Chapter 5 SP: Chapter 14
18	10/5	That sure is yummy! (Gustatory system)	MM: Chapter 5 SP: Chapter 15
19	10/8	Why can't I see that thing right in front of my face? (The eye and optics.)	MM: Chapter 7 SP: Chapter 5
	10/10	Review for Exam 2	
	10/12	**Exam 2, 75 points (covers lectures 11-19)**	
20	10/15	Can you see that? (It's right in front of you.) (The retina.)	MM: Chapter 7 SP: Chapter 5
21	10/17	OK, I see it now, then what? (From retina to brain.)	MM: Chapter 7 SP: Chapter 5
22	10/19	There's more than meets the eye. (Visual processing by the brain.)	MM: Chapter 7 SP: Chapter 5

23	10/22	What color is the dress? (Color vision.)	SP: Chapter 5
24	10/24	Is that what I think I see? (Perception of objects.)	MM: Chapter 4
25	10/26	Two eyes are better than one. (Binocular vision.)	MM: Chapter 6 SP: Chapter 6
26	10/29	Pay attention, this *will* be on the exam (Attention and consciousness)	MM: Chapter 14 SP: Chapter 7
27	10/31	Wait, wasn't that here just a second ago? (Scene and motion perception.)	SP: Chapter 8
	11/2	Review for Exam 3	
	11/5	**Exam 3, 75 points (covers lectures 20-27)**	
28	11/7	Keeping everything under control. (The brain and homeostasis.)	MM: Chapter 9
29	11/9	I learn but do I remember? (Learning and Memory I.)	MM: Chapter 13
30	11/12	Oh, yeah, now I remember (Learning and Memory II.)	MM: Chapter 13
31	11/14	Wake me when it's over. (Biological rhythms and sleep.)	MM: Chapter 10
32	11/16	The brain is the largest sex organ. (Hormones and sex.)	MM: Chapter 8
33	11/19	What could possibly go wrong? (Brain disorders.)	MM: Chapter 12
	11/21	*University Holiday (Thanksgiving)*	
	11/23	*University Holiday (Thanksgiving)*	
34	11/26	How did you say that? (Language.)	
35	11/28	We have two brains (Left brain and right brain.)	MM: Chapter 15
	11/30	Review for Final Exam	
	12/7	**Friday, Dec. 7, 11:00 am – 1:00 pm** **Final Exam 175 points** **(covers lectures 28-35 (and also lectures 1-35))**	

Please note the following important dates:

Friday, September 7 is the last day to change from a letter grade to Pass/No Pass option.
Friday, September 7 is the last day to drop without a "W" and receive a refund.
Friday, October 5 is the last day to change from Pass/No Pass option to a letter grade.
Friday, October 5 is the last day to drop without a "W" (no refund).
Friday, November 9 is the last day to drop with a "W".

Academic conduct, students with disabilities:

Any student requesting academic accommodations based on a disability is required to register with the Office of Disability Services and Programs (DSP, STU 301, 213-740-0776) each semester. You must deliver an approved DSP letter to Dr. Moore early in the semester as possible. Please see SCampus (http://www.usc.edu/dept/publications/SCAMPUS/) for additional policies that are not covered here (i.e. academic integrity, proper conduct, etc.) but that do still apply.

Laboratory portion of course:

There is no lab manual. Lab exercises will be handed out prior to laboratory meetings. Grading of the lab portion will consist of eleven lab quizzes (7 points each) and performance on an oral presentation (23 points). See below for the schedule of these. Presentations will consist of a ten to fifteen minute oral report on a topic of students' choosing. Presentation topics must be related to neuroscience and must be approved by the instructor at least three weeks before the beginning of the three weeks of presentations (see below). The use of visual aids in the presentation is expected (*e.g.* PowerPoint slides). Grades will be assigned on the basis of organization, subject knowledge and the clarity of the presentation. A grading rubric for the presentation will be made available on Blackboard. Lab quizzes will be given in the first five minutes of lab (and only the first 5 minutes of lab). Note: those arriving later than five minutes after the beginning of lab will not be allowed to take the quiz and will earn a zero for that quiz. Lab quizzes will be based on the exercise or presentations from the previous week.

Week of…	**Laboratory Exercise**	**Lab Quiz?**
Aug 20th	No Labs	No
Aug 27th	Scientific Method 1	No
Sept 3rd	No Labs	No
Sept 10th	Scientific Method 2	Yes
Sept 17th	Membrane Transport	Yes
Sept 24th	Nerve Impulses	Yes (Presentation topics need to be approved by this week.)
Oct 1st	Muscle and Reaction Time	Yes
Oct 8th	Sheep Brain Dissection	Yes
Oct 15th	Presentations	Yes
Oct 22nd	Presentations	Yes
Oct 29th	Presentations	Yes
Nov 5th	Electroencephalograms	Yes
Nov 12th	Galvanic Skin Response	Yes
Nov 19th	No Labs - Thanksgiving	No
Nov 26th	Senses	Yes

The laboratory portion of the course totals 100 points as follows:

Number	**Points**	**Exercise**	**Total Points**
11	7	Lab Quiz	77
1	23	Presentation	23