Advanced Neuroscience, Bisc 533
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Class: TuTh 11-12:15, Shoemaker 405; Office Hours: 2-3 TuTh or by appointment

Course Description: This course is designed to advance your understanding of the basic tenets of neuroscience and their application in seminal or current research. For several topics in neuroscience, we will review basic concepts in lecture form and then discuss papers that address contemporary problems or review research in this area. We may have guest lecturers for some topics.

Learning Objectives:
1) To reinforce several core concepts of neuroscience 2) To help students understand these concepts and speak intelligently about how these concepts have been explored in research. Graduate students will, in addition, learn to efficiently summarize literature and practice writing a grant proposal or literature review. 3) Group teaching/learning and individual responsibility for your educational experience are a part of this course. Each group of students is unique and can change the pace of the course. I will stick to scheduled exam times, but be prepared for changes in the specific date for discussion sections. However, participants will always be given adequate notice of any changes in the schedule to manage preparation of their presentations.

Course Format
We will alternate between lectures and discussions of manuscripts. While participation in discussion sections are 30% (graduate) to 40% (undergraduate) of your grade, they are not a "gimme" part of the course. Rigorous preparation by all participants is necessary for an enjoyable and educational discussion.

Basic Seminar Assignments
    Undergraduates: You will be graded on your participation in discussion sections, the quality of 3 discussion questions you will submit, your written responses to selected peer questions, and the quality of your 10-15 minute summary of 1-3 papers used to initiate discussions.

    Graduate students: In addition to the above, you will be required to complete a one page summary and review of each paper we discuss. You will also be expected to both initiate your assigned discussion section as well as lead the discussion section. Lastly, you will need to prepare one background lecture for a paper you would like to have us discuss.

Seminar Assignments and Participation
    We will use group participation in class and peer "pair and share" outside of class to review the papers we read and to build on knowledge from lectures. There is a method to my madness. If you participate fully in class discussions, answer your peer questions, and thoughtfully review your peer responses, you will have very little studying to do in preparation for the midterm and the final. In addition, since a large portion of your grade is based on the quantity and quality of this participation, your grade is easily bolstered by keeping on top of your reading assignments and showing up prepared.

            Participation: Discussion participation will be graded based on a combination of how active you are in the discussion and, the quality of the three questions/discussion points for each discussion section and, for graduate students only, the quality of journal article summaries. It is acceptable for one of your three questions to relate to details of the paper that you did not understand, but you should be doing outside research to clear up most questions about methods or concepts you are unfamiliar with. Strong discussion points should critically address experimental methods or theoretical conclusions. You will submit your questions via discussion forums on Blackboard so that all students will have access to the materials. I suggest you prepare your materials in a text editing program and then paste your text into the Thread so your writing will not be lost if the network crashes. As the semester progresses, you should try to think of integrative questions that address how the papers we are reading relate to each other. Questions must be posted

by NOON THE DAY BEFORE each discussion. Please bring a copy of your questions with you to class. Be sure to plan accordingly to get the papers read and to write your post on time. For most papers, you will need to read the text many times and look up terms and techniques to be prepared for discussion. It is NOT ACCEPTABLE to come to class without having thoroughly read the assigned paper. Your fellow students are depending on your cooperation. Pop quizzes will keep you honest.

Pair and Share: During class, we will endeavor to allow each student to speak and address a point of concern or question they had about the paper. It is unlikely that we will have time to get to all the questions each student has. Thus, we will take 10 minutes at the end of each discussion to pair up and review which questions remain, require more in depth research to fully answer, or seem fun and interesting to research. Please pair with a different student each discussion. You must each select from your partners' questions list the most substantial question that was not fully answered in class. If portions of the question were discussed in class, summarize what was said in class and then extend the discussion to fully answer the question. If one or both of you had all of your questions answered fully in class, then you must come up with new questions for each of you to answer. Responses to you and your partners questions or discussion points must be POSTED BY 8 am THE DAY AFTER THE DISCUSSION (Wednesday or Friday at 8am). I advise you to complete your responses as soon after the discussion as possible so that the paper is fresh in your mind.

Please give your peer a score of 0-4 stars for the quality of the initial questions they posted before class. These scores will not be used in my grading, but will provide feedback to your partner that they might want to up their game. To give a strong answer to your peer's questions you may need to review some of the references cited in the discussion paper, consult a textbook or your lecture notes, or do your own literature review. Provide references for any papers you use to qualify your answer. Don't make your answer too technical or complicated. The idea is to help your partner and the rest of your peers to understand a concept not to impress me with your intellectual prowess. I want everyone to learn, but I do not want this exercise to be overly burdensome. Answers should be no more than one paragraph.

Review Answers: Once your partner has provided a response to your queries, you will need to review their answers. It will be necessary for you to read the supporting materials your peer provides in order to be sure that you agree with their assessment. So, let's try to keep our answers fairly contained so that no one has to read 8 papers to judge your answer. If you are still confused or disagree with some points made by your peer, or believe the response requires further information to be complete, you will respond with edits, suggestions, or further research. You can use track changes to edit their response, or give a fresh response while referring to their answer. You should provide citations for any additional references you use to modify their answer to the questions. Give your peer a score of 0-4 stars for the quality of their answer. These scores will not be used in my grading, but provide your peer feedback. Please take advantage of chatting with one another on blackboard or by any other means to discuss points with your partner or other students. You are welcome to discuss points with classmates, just be sure the final writing is your own. If you cannot put the points in your own words, you do not understand the material. Complete your reviews by 5pm the day you receive them. So, this will be 5pm on a Wednesday or Friday.

Logistics: Please be sure to clearly note in the discussion thread titles whether you are producing initial questions, providing responses to questions, or reviewing answers. Note the paper topic or title and who your partner is.

PLEASE, PLEASE, PLEASE DO NOT PLAGERIZE AND DO NOT QUOTE. ALWAYS PUT INFORMATION IN YOUR OWN WORDS AND PROVIDE REFERNCES FOR WHERE IDEAS COME FROM. PROVIDING A CITATION DOES NOT GIVE YOU PERMISSION TO QUOTE OR PARAPHRASE. PLEASE REVIEW PLAGERIZING MATERIALS I PROVIDE ON BLACKBOARD.

Copies of all questions and answers will be accessible on Blackboard. You should review the answers to all of the questions and determine for yourself if the answers provided are correct. Making the initial questions intelligent and thoughtful and determining the accuracy of responses is very important. If the questions are intelligent and the answers are correct these materials will provide you an excellent study guide for the exams.

You will be given one point just for attending the discussion. For each discussion section you will earn between 0 – 20 points based on your attendance, preparation, and level of activity judged by both your in class discussion and your work on your questions and answers. You will not be penalized for having answers that are not 100% correct, but you will lose points if questions are of low quality, if the questions do not focus on the paper and course contents, and if the questions indicate you had a poor grasp of the paper.

Seminar Presentation: Each of you will have papers to present to the class. You will have just about 15 minutes to report on what are sometimes long and complicated articles. Do not try to cover every detail of the paper. Instead select the major ideas of the paper and the key points of the experiments performed or described. You should clearly state the hypothesis for experimental papers or the theoretical point for review papers. Present the experiments performed or reviewed being sure to address how these support the theoretical points or test the hypothesis. Summarize the findings and give the author's interpretations and conclusions. You should be able to tell us what sort of experiments would come next to further support the author's points. Lead off your discussion with a provocative question or point. There are times when I will interject in your discussions to make sure certain points get covered, but I would like for presenters to try to lead the discussions. Presentations can take the form of a PowerPoint or can be a written outline. You must post the supporting documents to Blackboard by 9pm the night before your discussion so that anyone that wants to print the documents will have time to do so.

A score from 0-50 will be assigned based on the following performance indicators
50 – Summarized main points effectively, described support for main points, evaluated how effectively support addressed main points. Included insights associated with an outside source or other class materials (especially graduate students).
40 – Summarized main points effectively, described support for main ideas, but neither evaluated how well the support addressed the main points nor included additional insights from related materials.
30 – Reiterated paper contents rather than summarizing and evaluating.
20 - Poor reiteration of paper contents.
10 – Ill prepared.

Exams: There will be one in class exam and a take home final. Exams will cover material presented in lectures and discussion sections and will consist of essay questions.

Homework: We will have occasional homework assignments. Points on homework assignments will be extra credit and added to your exam points.

Graduate Student Paper: You will also need to submit a 5-7 page literature review or mini-grant proposal on a topic of your choosing (with consent of the instructor). Papers will be due two weeks before the final exam.

Outreach: All students must participate in the Neuroscience Research Showcase during our class period on February 21st. Graduate students must prepare a poster for the showcase on completed or planned research. Undergraduates that are participating in an independent study course should do the same. You can team up if you are working on the same project, but cash prizes are awarded for the best posters and if there is more than one presenter, you would have to split prizes should you be awarded. If you are not involved in a research project you

have several options for poster content. Please review your ideas with me. You could present a poster that analyzes a paper and proposes a follow up experiment, a paper that reviews some topic in the history of neuroscience, propose a novel instructional technique for teaching neuroscience, or proposes a set of novel experiments to test a hypothesis you have been thinking about. Do what comes most naturally to you. You are allowed to present a paper on the same topic, even the exact paper, you will use for your class presentation if you feel best prepared for that avenue. Further participation in the Neuroscience Showcase by attending the public lectures or the biology seminar will provided 5 extra credit points for each event you attend which would be added to your exam scores.

Grade Breakdown: For your in class paper presentation and your poster presentation at the Research Showcase, I will give more weight to whichever one is stronger in determining your final overall score for this component of your grade. Judges will be coming by to evaluate your presentation of your poster for the showcase. I will use their scores in combination with my own judgement of your poster content to determine a score. It is unlikely I will be able to visit each poster to hear your presentation.

Undergraduates: Participation 40% (0-20 points for each discussion), Presentation and Outreach 20% (0-50 points for your presentation, 0-130 points for your Research Showcase poster), Midterm Exam 20% (0-100 points), Final Exam 20% (0-100 points).

Graduate Students: Participation 30% (0-20 points for each discussion), Lecture, Presentation, and Outreach 15% (0-50 points for your presentation, 0-50 points for your lecture, 0-130 points for your Research Showcase Poster), Midterm Exam 20% (0-100 points), Final Exam 20% (0-100 points). Final Paper 15%.

 A (90-100%); B (80-89%); C(70-79%); D(60-69%); F (59% and below). I will use the plus/minus grading system. Cut off levels will be determined by examining the grade distribution of the class rather than by using a particular percentage. However, you would not obtain a minus for a percentage score in the middle to upper third of the percentage spread for that letter grade regardless of the class distribution.

Attendance: Attendance is graded as part of your participation grade and you must sign the attendance sheet to be counted as present (paper or electronic). It will be very difficult to do well in this course if you do not attend both lectures and discussions. If you have a verifiable excused absence you will not have points deducted from your participation grade. When absent, you are still responsible for submitting your discussion questions, and will still be held responsible for material covered, so please do not hesitate to come see me during office hours if you have questions.

Attendance First Two Weeks: The University must comply with federal mandates that require us to submit attendance reports for the first two weeks of class. Unless you have some special exception such as personal or family health issues or University based excursions that will keep you out of class the first two weeks of school, you must be certain to attend class at least once during the first two weeks or you will be dropped from the class. Attendance will be verified by signing a sign up sheet when you come to class.

Accommodations: Students with disabilities, which have been verified through the Office of Student Disability Services, are encouraged to contact the instructor to discuss their individual needs for accommodations.

Make-up Exams: If you miss the first exam, you must contact the instructor within one week or you will be given a zero for the exam.   Make up exams will be given only for reasonable and documented excuses. Make-up exams will cover the same material as that given during the scheduled time but will not contain the same questions. There will be no makeup exam for the final.

Reading: I suggest you purchase "Neuroscience: Exploring the Brain," Bear, Connors, and Paradiso, 4th edition or a similar text. If you are having trouble affording this text, please see me. I have similar texts that can be checked out. Other readings for lectures and discussions will be available on blackboard or handed out in class. I will not assign particular chapters from the text book. You are quite capable of recognizing the pertinent chapters for the

topics we will be covering. I will also post websites, topic outlines, topic summaries, chapters from text books, etc. that you can use as background reference materials. Many of the lectures are meant to be reviews of material you have already learned and we will move quickly. Review materials before class! Do not hesitate to ask questions, but also understand that I may have to put off answering the question until after class. Bottom line, if you are still confused about particulars after a lecture, you are responsible for finding reading materials to assist you with understanding and making sure you visit with me during office hours or by appointment if necessary. Discussion topics may change if exciting new research in the area appears. Please note that all of the readings will be very dense material and will require a good deal of thinking on your part. Make sure you give yourself enough time to read and reread and digest the material. It will be very obvious in discussions if you have not read the papers or have given them only a quick read.