NEURBIO 209 LEC A: BEHAVIORAL NEUROSCI (11500)

N209: Behavioral Neuroscience
Spring 2019

The focus of this course is on understanding the relationship between brain and behavior. The human brain's major naturally-selected function is to generate adaptive behavior under a variety of conditions, including with reference to prior experience. In this course we will discuss how the brain mediates major behavioral functions, how these go awry in psychiatric disorders, as well as major methodological approaches used in behavioral neuroscience research. The format of the course is a mixture of presentations led by the instructor and seminar style discussions incorporating assigned readings. There is a strong emphasis on class discussion and participation, with students expected to have read, thought about, and discuss primary-source papers.

Lecture times: MWF 9-10:20AM; McGaugh Hall 2246

Web site: The class web site https://canvas.eee.uci.edu/courses/16127 will include up-to-date information on the lecture schedule and assigned readings. Lecture slides will also be posted.

Add & Drop Policy: Adds and drops are handled exclusively through WebReg. The add/drop deadline is April 13, 2018 and students are responsible for all materials from the start of the term. Failure to take any exams or quizzes, even those given before you have added the course, will result in a zero score for each quiz or exam.

Instructors:
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Grading: There will be three midterm exams and each will account for 20% of your total grade. 15% will be based on an end-of-term project proposal, 5% on your participation in the "Neuroscience Controversies" session, and 20% on class participation.

Neuroscience Controversies:
Near the end of the quarter, we will engage in an active learning session where you will construct a debate-style argument in favor of an assigned position in a current neuroscience controversy. You will work in a group of 2-3, and will be assigned a position to defend in the debate. Each group member will speak in the debate, presenting an informal opening statement, rebuttal, or closing statement. We expect this format will help develop critical thinking and group operation skills.

Final Presentation:
Presentations will occur on the last 3 days of class**.** You will do a "data blitz" style presentation (maximum 15 min, preferably 10) on a research question of your choice stemming from presentations/discussions we've had in class.
Guidelines:

15m total time per student, so aim for a maximum of 10min to make sure there is plenty of time for questions (and there will be questions!). You will be cut off at 15min exactly (not counting any questions asked during the presentation), so be careful. Shorter is not equal to worse! We don't need all the details or nuance, the goal here is to convey the major points in an efficient and punchy manner.

Your assignment is to design an experiment or set of experiments to address any of the topics raised during class (but not something that you have done as a project in a rotation lab). KEEP IT SIMPLE! Pretend you're pitching the idea to a grant agency / donor on a 10min elevator ride (a skyscraper I guess?). This is not supposed to be a full grant, just an experiment that tests a single, currently unknown concept or question.

The experiment should be viable, but don't worry about actual costs, and assume a lenient (but realistic) IRB/IACUC. In other words: "Effects of space travel on working memory=OK. Effects of time travel on working memory=not OK." (but make sure there is a reason to think, e.g., space travel might affect memory, since gravity is known to affect pyramidal cell function).

Pick a topic, focus in on a concrete question, and design the experiment. Clarity in your thinking is key here. Why are you asking this question--what gap in knowledge is there, and why should I care about this topic? Is the experiment really testing what you want it to? How would we interpret your results?

The presentation should have:

A **brief** background setting the stage for what we know and don't (1-2 slides)
The question and clearly stated hypothesis (1 slide)
The experiment and how the results will address the issue (1-2 slides)
Alternative outcomes / potential problems (1-2 slides).

You will be graded on 1) clarity of the background information/topic to be studied, 2) clarity of, and importance of the question to be addressed 3) efficacy of your experiment in providing an answer to that question, 4) presentation style and ability to answer questions, 5) respecting the time limit.

Policy on Academic Dishonesty: The UCI policy on academic dishonesty is stated at: http://www.editor.uci.edu/catalogue/appx/appx.2.htm#academic. Lying to an instructor with the intent of improving a grade, or use of a restricted electronic device during an exam are considered forms of academic dishonesty. Any student aware of academic dishonesty is encouraged to bring this to the attention of the instructor; your confidentiality is guaranteed.

Readings: It is your responsibility to read the assigned articles before class. This is a discussion-based class and having read the materials ahead of time is essential ***Note:*** Readings and schedule subject to change at the instructors' discretion.'

Lecture schedule and reading assignments

Date	Instructor	Topic	Reading
Mon 04/01	Mahler	Intro, Genes and Brain Evolution 1	Syllabus
Wed 04/03	Mahler	History and conceptual issues in analysis of brain-behavior relationships (McGaugh Guest Lecture)	McGaugh (2003) Ch 2-3
Fri 04/05	Mahler	Genes and Brain Evolution 2	Dawkins, Selfish Gene Ch. 3-4
Mon 04/08	Mahler	Evolutionary Psychology	Cosmides & Tooby, 2006
Wed 04/10	Mahler	Mind and Brain	Kaushik et al 2012; Worth et al 2013
Fri 04/12	Mahler	Functional Neuroanatomy: Neural Circuits in Motivated Behavior	Zahm 2006; Richard et al 2013

Mon 04/15	Mahler	Sleep and Wakefulness	Schwartz & Kilduff, 2015; Donlea et al 2017
Wed 04/17	Mahler	Homeostasis: Feeding, Drinking & Temperature	Zimmerman et al 2017; Munzberg et al, 2016
Fri 04/19	Mahler	**Exam 1**	
Mon 04/22	Fowler	Hormones	Balthazart et al., 2018; Oberlander & Woolley, 2017
Wed 04/24	Fowler	Development	Gilmore et al., 2018; Sorrells et al., 2018
Fri 04/26	FortFowlMahl	**CNLM Meeting**	
Mon 04/29	Fowler	Stress and Aggression	Joels & Baram, 2009; Falkner et al., 2016
Wed 05/01	Fowler	Sex and Social Behavior	McCarthy et al., 2017; Amadei et al., 2017
Fri 05/03	Fowler	Reward, Aversion and Addiction	Morales & Margolis, 2017; Wise & Koob, 2014
Fri 05/06	Fowler	Psychopathology	Birnbaum & Weinberger, 2017; Yang et al., 2018
Wed 05/08	Fowler	Neurodegenerative Disorders	Baecher-Allan et al., 2018; Liddelow et al., 2017
Fri 05/10	Fowler	**Exam 2**	
Mon 05/13	Fortin	Multiple Memory Systems	Sherry & Schacter (1987); Squire & Dede (2015)
Wed 05/15	Fortin	Functional Neuroanatomy of Medial Temporal Lobe	Van Strien et al. (2009)
Fri 05/17	Fortin	Declarative, Episodic, and Semantic Memory	Eichenbaum (2000); Squire & Wixted (2011); Tulving & Markowitsh (1998)
Mon 05/20	Fortin	Spatial Memory and Computations (McNaughton Guest Lecture)	McNaughton et al., (2006); Knierim (2015)
Wed 05/22	Fortin	Attention	Petersen & Posner (2012); Reynolds et al., (2013)
Fri 05/24	Fortin	Emotion	Phelps (2006); McGaugh (2013); Etkin et al., (2015)
Mon 05/27		**Holiday - no class**	
Wed 05/29	Fortin	**Exam 3**	
Fri 05/31	FortFowlMahl	Neuroscience Controversies	
Mon 06/03	FortFowlMahl	Presentations	
Wed 06/05	FortFowlMahl	Presentations	
Fri 06/07	FortFowlMahl	Presentations	