

**PSY 627 - Proseminar in Physiological Psychology
SPRING 2019**

Class hours: Wednesday 1 – 3:30

Classroom: POT 110

Team Teachers:

Dr. Michael Bardo
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Dr. Susan Barron
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Dr. Mark Prendergast
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Office hours: by appointment

Required Textbook: NR Carlson and MA Birkett (2017) *Physiology of Behavior*, 12th Edition,

Outline: This class provides an introduction to structural and functional characteristics of the nervous system. The emphasis is on exploring the relationship between brain and behavior. Topics range from simple brain structures and behaviors to more complex functions such as drug addiction and other psychiatric illnesses. The biological basis of normal and abnormal behavior is explored from a multidisciplinary perspective.

Student Learning Outcomes: After completing this course, the student will be able to (1) describe the primary anatomical and physiological components of the central nervous system; (2) Understand the role that such components play in behavior; (3) Describe the nature of brain pathologies in major psychological diseases, the behavioral correlates and the pharmacological or biological treatment of these pathologies.

Attendance: Attendance is not a course requirement. However, the material discussed in class is always heavily represented on exams. If you must miss a class, we strongly recommend getting the class notes from someone else.

Accommodation Due to Disability: If you have a documented disability that requires academic accommodations, please see me as soon as possible. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Suite 407 Multidisciplinary Science Building 725 Rose Street (Building 82 on the campus map, 257-2754).

Canvas: We will use the Canvas email distribution system for all class announcements and to post all lectures.

Cheating: Cheating is not tolerated. Cheating as either giving or receiving help during exams or during the writing of a paper. This can be from a classmate or any other method. In addition, any written assignment for this class is to be done independently and working on written assignments together also constitutes as cheating. If you need further clarification of what the University defines as cheating, please read the description in your Students Rights and Responsibilities Handbook. Anyone caught cheating will at minimum receive a zero and likely fail the course.

Grading: Your grade will be based on the % correct on 3 exams, including the final (100 points each, a total of 300 points), and completion of 3 “thought papers” based on readings of the primary literature (25 points each for a total of 75 points). Each exam will consist of multiple choice, short answer and/or essay questions. If an emergency arises and you must miss class on an exam day, please let me know prior to class. Make-up exams should be scheduled as soon as possible. Final grades will be assigned on a curve based upon overall exam performance and completion of all thought papers. Regardless of class performance, however, 90% is guaranteed an "A", 80% at least a "B", 70% at least a "C", 60% at least a "D" and below 60% an E. Each student is required to read 3 primary literature papers throughout the semester, chosen from the list below (pages 4-5), and complete a 5-page thought paper discussing (1) the primary topic of the paper (2) the findings and interpretations of the authors; and (3) your individual interpretations of the data's relevance to human behavior. Each thought paper must be turned in via e-mail to Dr. Bardo by 5 PM on each Wednesday before the following week's exam. Each day late will result in a 5 point reduction in maximum points for the paper.

Syllabus

<u>Date</u>	<u>Chapter</u>	<u>Topic</u>	<u>Lecturer</u>
Jan 9	1	Introduction	Bardo
Jan 16	2	Structures and Functions of Nerve Cells	Prendergast
Jan 23	3	Structure of the Nervous System	Barron
Jan 30	4	Psychopharmacology	Bardo
Feb 6	4	Psychopharmacology	Bardo
<i>Thought paper #1 due</i>			
Feb 13		EXAM 1	
Feb 20	10	Reproductive Behavior	Prendergast
Feb 27	11, 14	Emotion, Lateralization and Communication	Barron
Mar 6	12	Ingestive Behavior	Bardo
Mar 13		SPRING BREAK	
Mar 20	13	Learning and Memory	Prendergast
<i>Thought paper #2 due</i>			
Mar 27		EXAM 2	
Apr 3	15	Neurological Disorders	Prendergast
Apr 10	17	Stress, Anxiety, Neurodevelopmental Disorders	Barron
Apr 17	16	Schizophrenia and Affective Disorders	Bardo
Apr 24	18	Drug Abuse	Bardo
<i>Thought paper #3 due</i>			
May 1 (1 PM)		EXAM 3	

Thought Papers: As stated above, each student is required to complete 3 “thought papers”, described above based on their reading of one of the following primary literature papers. Students may choose 1 of the suggested papers to read for each of the 3 semester blocks of chapters. Each paper is either freely available to the general public via the website www.pubmed.com OR is available through the University’s electronic subscription to the journal.

Block 1 (Chapters 1-4, 9): please choose 1 of the following readings to read for your thought paper

Cole MW, Yarkoni T, Repovs G, Anticevic A, Braver TS. (2012). Global connectivity of prefrontal cortex predicts cognitive control and intelligence. *J Neurosci* 32:8988-8999.

Carlen M. (2017). What constitutes the prefrontal cortex? *Science* 358: 478-482.

Hanson JL, Chung MK, Avants BB, Rudolph KD, Shirtcliff EA, Gee JC, Davidson RJ, Pollak SD. (2012). Structural variations in prefrontal cortex mediate the relationship between early childhood stress and spatial working memory. *J Neurosci* 332: 7917-7925.

Pritt SL, Hammer RE. (2017). The interplay of ethics, animal welfare, and IACUC oversight on the reproducibility of animal studies. *Comp Med* 67: 101-105.

Quattrone A, Barbagallo G, Cerasa A, Stoessl AJ (2018) Neurobiology of placebo effect in Parkinson’s disease: What we have learned and where we are going. *Mov Disord* 33: 1213-1227.

Peever J, Fuller PM. (2017). The biology of REM sleep. *Curr Biol* 27:R1237-1248.

Block 2 (Chapters 10-14): please choose 1 of the following readings to read for your thought paper

Poeppl TB, Langguth B, Rupprecht R, Safron A, Bzdok D, Laird AR, Eickhoff SB. (2016). The neural basis of sex differences in sexual behavior: a quantitative meta-analysis. *Front Neuroendocrinol* 43: 28-43.

Godar SC, Fite PJ, McFarlin KM, Bortolato M. (2016). The role of monoamine oxidase A in aggression: current translational developments and future challenges. *Prog Neuropsychopharmacol Biol Psychiatry* 69: 90-100.

Chaaya N, Battie AR, Johnson LR. (2018) An update on contextual fear memory mechanisms: transition between amygdala and hippocampus. *Neurosci Biobehav Rev* 92: 43-54.

Fletcher PC, Kenny PJ. (2018). Food addiction: a valid concept? *Neuropsychopharmacology* 43: 2506-2513.

Cizza G, Requena M, Galli G, de Jonge L. (2011). Chronic sleep deprivation and seasonality: implications for the obesity epidemic. *J Endocrinol Invest* 34: 793–800.

Gagnepain P, Hulbert J, Anderson MC (2017) Parallel regulation of memory and emotion supports the suppression of intrusive memories. *J Neurosci*, 37: 6423-6441.

Block 3 (Chapters 15-18):

Buchman AS, Boyle PA, Yu L, Shah RC, Wilson RS, Bennett DA. (2012). Total daily physical activity and the risk of AD and cognitive decline in older adults. *Neurology* 78: 1323-1329.

- O'Donnell KJ, Meaney MJ. (2017). Origins of mental health: the developmental origins of health and disease hypothesis. *Am J Psychiatry* 174: 319-328.
- Abdallah CG, De Feyter HM, Averill LA, Jiang L, Averill CL, Chowdhury GMI, Purohit P, de Graaf RA, Esterlis I, Juchem C, Pittman BP, Krystal JH, Rothman DL, Sanacora G, Mason GF. (2018). The effects of ketamine on prefrontal glutamate neurotransmission in healthy and depressed subjects. *Neuropsychopharmacology* 43: 2154-2160.
- Tang YY, Tang R, Posner MI. (2016). Mindfulness meditation improves emotion regulation and reduces drug abuse. *Drug Alcohol Depend* 163 Suppl 1: S13-18.
- Nguyen VT, Chong S, Tieng QM, Mardon K, Galloway GJ, Kurniawan ND. (2017). Radiological studies of fetal alcohol spectrum disorders in humans and animal models: An updated comprehensive review. *Magn Reson Imaging* 43: 10-16.
- Manini AF, Yiannoulos G, Bergamaschi MM, Hernandez S, Olmedo R, Barnes AJ, Winkel G, Sinha R, Jutras-Aswad D, Huestis MA, Hurd YL. (2015). Safety and pharmacokinetics of oral cannabidiol when administered concomitantly with intravenous fentanyl in humans. *J Addict Med* 9: 204-210.