

Psychology 435 (Section 01)
Advanced Neuroscience and Behavior
Fall 2021, Th. 6 – 8:50 pm in ASH 2310

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(email is the best way to reach me and you will receive a response within 2 business days)

Office hour: T. Th. 12:50–1:50 pm in person at ASH 2204 or on Blackboard Collaborate at the following link:
<https://us.bbcollab.com/guest/04bc13e0df7342fd925a1e58292953f8>

Please click the following link to schedule your appointment for a time slot on T. Th. 12:50–1:50 pm
<https://calendar.google.com/calendar/u/1?cid=Y19pYm4wYnZib2R0ODNobnJmdmFoZXNlbmlxMEBncm91cC5jYWxlbmRhci5nb29nbGUuY29t>

Texts:

Required: Carlson, N.R. (2017). Physiology of Behavior (12th ed.), Pearson.

Recommended: Materials on course reserve that can be accessed through the course blackboard

Course description:

This course will examine the physiological basis of behavior in depth. Among topics to be covered are the following: the nervous system, psychopharmacology, research methods used to study the physiological basis of behavior, and the neural mechanisms involved in perceptual and motor processes, ingestive behaviors, learning and memory, language, and neurological and psychiatric disorders. The topics already covered in Psy 330 will be covered in depth in this course. Lectures will focus on selected concepts and theories. Students will be responsible for all materials presented in the texts as well as lectures. Prereq. Psy 101 and 330.

Learning objectives:

Upon successful completion of this course, students will be able to:

- Describe the process of action potential, including how and why they occur
- Explain in detail the steps of neurotransmission
- Identify the behavioral function of major brain chemical systems
- Critique original research in behavioral neuroscience
- Discuss current topics in behavioral neuroscience research

Course delivery/method of instruction:

This course is taught in face-to-face formats, but also using Blackboard for quizzes and assignments. Although the course blackboard contains video lectures used in previous semesters for your convenience, it is students' responsibility to make sure that they receive updated materials for this semester in class.

Course evaluation:

Exams and the Final Exam: There will be two within semester exams and a final exam. Each exam will be worth 50 points and the final exam 100 points. Exams and the final will consist of identification of brain structures, multiple choice, true-false, matching, and fill-in the blank questions. Multiple choice, true-false, and matching questions must be answered on the scantron sheet in order to receive any points for those questions. Students are not allowed to use any external materials, such as books, notes, paper, any devices, during any exams. In the final computation of your grade, the graded class participation 60 points described below will be included. The final grades will be based upon your percentage of total points (number of points you earned divided by total number of points possible, which is 260).

Graded class participation: Class participation including quizzes, group activities / assignments, and group presentation will be worth 60 points. Quizzes and assignments will be given in the course blackboard, and are

open-book and open-notes. Class participation including quizzes and assignments is intended to guide students towards important concepts or theories or key issues and help students prepare for exams, and the class participation points (resulted from quizzes and assignments that are open-book and open-notes) are intended to increase students' grade. This course focuses on learning the particular material. Students receive participation points for demonstrating learning with the aid of books and notes. **Quizzes and assignments are open-book and open-notes, but they are graded. Note:** No individual students will be given any opportunity to earn extra points. Any possible opportunity to earn extra points will be given in class. Early in the semester, students will form groups of 5 people and choose a topic regarding neurological disorders. Each group will then make a presentation during the last week of the semester. The group will be evaluated by the class and the instructor on a scale of 1 to 10 with 1 being poor and 10 being excellent. The rating will then be converted into points. The group presentation will be worth 22 points, and other class participation together will be worth 38 points.

Missed exams / Make-up exams: Any within semester exam that any student cannot take as scheduled in this syllabus is considered as a missed exam. There will not be any make-up exams. A score of "0" will be given in any missed exam. Students with documentations that can substantiate legitimate reasons for missing a scheduled exam will receive prorated points according to the performance on the final exam. You must notify me in writing of your reason for missing the exam and turn in the documentations to me within a week of the missed exam. If I do not receive a written notification and documentations within a week of the missed exam, you will receive "0". Students who cannot take the final exam as scheduled in the syllabus will take a different version of the final exam consisting of essay questions.

Grading:

A - to A	= 90 - 100 %	D to D +	= 60 - 69 %
B - to B +	= 80 - 89 %	F	= below 60 %
C - to C +	= 70 - 79 %		

Course Schedule: (Underlined dates are exam dates)

Date	Topic	Reading assignments
Sept. 2	Neurons and synapses	Chapter 2
Sept. 9	Anatomy of the nervous system	Chapter 3
Sept. 16	Psychopharmacology	Chapter 4
Sept. 23	Methods and strategies of research	Chapter 5
Sept. <u>30</u> (2-5)	Exam I	
Oct. 7	Vision	Chapter 6
Oct. 14	Audition, and the body and chemical senses	Chapter 7
Oct. 21	Control of movement	Chapter 8
Oct. 24-26	Fall Break	
Oct. 28	Ingestive behavior	Chapter 12
Nov. <u>4</u> (6-8, 12)	Exam II	
Nov. 11	Learning and Memory	Chapter 13
Nov. 18	Human communication	Chapter 14
Nov. 25	Thanksgiving recess	
Dec. 2	Psychiatric disorders	Chapters 16 & 17
Dec. 9	Neurological disorders (student presentations)	Chapter 15

Dec. 16, Th. 6 – 7:50 pm: Final Exam (2, 3, 4, 13, 14, 15, 16, 17)

Drop deadline - grade of "W" - Fri., Oct. 29, 5 pm.

This course is subject to the GVSU policies listed at <http://www.gvsu.edu/coursepolicies>

Academic Integrity

Students will do original work and will not take or receive the efforts of another person on any test or assignment, use unauthorized resources on quizzes or tests, plagiarize, or give/sell other students papers or assignments *not authorized by the instructor*. **You are responsible** for not giving the appearance of cheating, such as wandering eyes or talking during exams. **You are responsible** for making yourself aware of and for understanding the policies and procedures that pertain to academic integrity. To that end, be sure to familiarize yourself with the GVSU Student Code related to academic integrity and [Integrity of Grades & Scholarship](#).

Disability

If there is any student in this class who has special needs because of a learning, physical, or other disability, please contact me and Disability Support Resources (DSR) at (616) 331-2490. Furthermore, if you have a disability and think you will need assistance evacuating this classroom and/or building in an emergency, please make me aware so that the university and I can develop a plan to assist you. It is the *student's responsibility* to request assistance from DSR.

Supplemental reading on reserve for Psy 435:

Chapters 2, 3, 4, 5

- Burguiere, E., Monteiro, P., Feng, G., Graybiel, A.M. (2013). Optogenetic stimulation of lateral orbitofronto-striatal pathway suppresses compulsive behaviors. *Sciences*, 340: 1243-1246.
- Kuypers, K. et al. (2019). Microdosing psychedelics: more questions than answers? An overview and suggestions for future research. *Journal of Psychopharmacology*, DOI: 10.1177/026988119857204.
- Mouro, F.M., et al (2018). Chronic, intermittent treatment with a cannabinoid receptor agonist impairs recognition memory and brain network functional connectivity. *Journal of neurochemistry*, <https://doi.org/10.1111/jnc.14549>
- Paschke, R.E. & Xu, X. (2014). Human Brain Anatomy: a video PPT of human brain dissection.
- Paschke, R.E. & Xu, X. (2014). Sheep Brain Anatomy: a video PPT of sheep brain dissection.
- Pinel, J.P. (2014). Biopsychology (9th ed). Boston: Allyn and Bacon. **(The following Pages are on E-reserve: 55, 59, 60, 65, 66, 71, 90, 96, 110, 131, 132, 140, 173, 174, 175, 179, 180, 188-202,196, 200, 201, 261, 262, 263, 343, 347,349, 350, 355, 364, 399, 411, 412, 451, 452)**

Chapters 6, 7, 8, and 12

- Davies-Thompson, J., et al. (2017). Perceptual learning of faces: a rehabilitative study of acquired prosopagnosia. *Journal of cognitive neuroscience*. 29(3): 573-591.
- Kim, et al (2014). Leptin signaling in astrocytes regulates hypothalamic neuronal circuits and feeding. *Nature neuroscience*, 17(7), 908-910. DOI:10.1038/nn.3725
- Li, W. et al. (2016). Extensive graft-derived dopaminergic innervation is maintained 24 years after transplantation in the degenerating Parkinsonian brain. *Proceedings of the National Academy of Sciences of the United States of America*, 113(23): 6544-9.
- Gerlach, C. & Starrfelt, R. (2021) Patterns of perceptual performance in developmental prosopagnosia: An in-depth case series, *Cognitive Neuropsychology*, 38:1, 27-49, DOI: 10.1080/02643294.2020.1869709
- Schmid, M.C., Mrowka, S. W., Turchi, J., Saunders, R. C, Wilke, M., Peters, A. J. et al. (2010). Blindsight depends on the lateral geniculate nucleus. *Nature*, 466(7304): 373-377.

Chapters 13, 14, 15, 16, 17

- Hoban, C., Byard, R.W., and Musgrave, I.F. (2015). A comparison of patterns of spontaneous adverse drug reaction reporting with St. John's Wort and fluoxetine during the period 2000–2013. *Clinical and Experimental Pharmacology and Physiology*. DOI: 10.1111/1440-1681.12424

- Gruchot, et al (2019). Neural cell responses upon exposure to human endogenous retroviruses, *Frontiers in Genetics*. DOI: 10.3389/fgene.2019.00655
- Malm, H. et al (2015). Pregnancy Complications Following Prenatal Exposure to SSRIs or Maternal Psychiatric Disorders: Results From Population-Based National Register Data. *The American Journal of Psychiatry*. DOI.org/10.1176/appi.ajp.2015.14121575
- Meinzer, M., Darkow, R., Lindenberg, R., et al. (2016). Electrical stimulation of the motor cortex enhances treatment outcome in post-stroke aphasia. *Brain: a journal of neurology*, 139(4): 1152-63
- Wikenheiser A.M. et al (2021) Spatial Representations in Rat Orbitofrontal Cortex. *Journal of Neuroscience*, 41(32):6933–6945.
- Xu, X., Weber, D., Burge, R., & VanAmberg, K. (2016). Neurobehavioral impairments produced by developmental lead exposure persisted for generations in zebrafish (*Danio rerio*). *NeuroToxicology*. 52, 176-185. DOI:10.1016/j.neuro.2015.12.009