

Psychology 435 (Section 02)
Advanced Neuroscience and Behavior
Fall 2021, T. Th. 11:30 am – 12:45 pm in ASH 1204

Instructor: Xandra Xu, Ph.D.
Office: 2204 Au Sable Hall
Mailing address: 1 Campus Dr., Allendale, MI 49401
Office Phone: 331-2411
Email address: xux@gvsu.edu
(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=Y19pYm4wYnZib2R0ODNobnJmdmFoZXNlbmlxMEBncm91cC5jYWxlbmRheci5nb29nbGUuY29t>

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

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