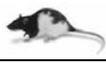


Course Syllabus
NSC 310: BRAIN AND BEHAVIOR
Spring 2017

COURSE INFORMATION

Class Times:	Monday and Wednesday 11:00-12:15
Class Location:	Trumbower 140
Lab Times:	Thursday 10:00-11:50 Thursday 2:00-3:50 Friday 10:00-11:50 
Lab Location:	New Science 124

INSTRUCTOR INFORMATION

Instructor:	Dr. Gretchen Hanson Gotthard
Email:	ggotthard@muhlenberg.edu
Office Location:	Moyer 324
Schedule Appointments:	Click HERE for available times

COURSE OVERVIEW

This course examines behavioral neuroscience perspectives on complex behavior in humans and other animals. Topics will be covered at a systems level and will include functional neuroanatomy, neurotransmitters and drugs, motor systems, emotions and stress, learning and memory, psychological and neurological disorders, and language. The lab component will examine neuroanatomy in detail, through the use of sheep brain dissection. Discussions of research methodology will culminate in student-designed and run behavioral neuroscience experiments using rats and humans.

GOALS AND OBJECTIVES

Over the course of the semester, students will work to refine their **critical thinking skills** (via problem solving, critical reading, scientific and informal writing, and group discussions), and their **presentation and collaborative skills** (via numerous group learning and presentation/discussion opportunities). Additionally, by the end of the semester, students should:

- know the terminology and experimental methods used by behavioral neuroscientists and apply it in conversation and in writing;
- be able to explain various behaviors from a physiological, reductionistic perspective, while retaining an appreciation for the limits of such explanations;
- be able to identify various structures in the mammalian nervous system, relate these structures to function, and understand the neural systems that contribute to complex human behavior (e.g., language, learning, emotion, memory, etc.);

- understand the neural correlates of common forms of psychological and neurological pathology (e.g., schizophrenia, depression, anxiety, Alzheimer’s disease, Parkinson’s disease, etc.), while maintaining a humane appreciation for the individuals suffering from these disorders;
 - think like a scientist by applying the scientific method appropriately, critically evaluating empirical literature, and honing skills in synthesis of scientific literature.
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RESOURCES

CANVAS: <https://muhlenbergcollege.instructure.com>

- All materials will be placed on Canvas, so *check regularly* - e.g., articles, case studies, assignments, PowerPoints, presentations, etc.

TEXTBOOK: Breedlove, S. M. & Watson, N. V. (2013). [*Biological Psychology: An Introduction to Behavioral, Cognitive, and Clinical Neuroscience \(7th ed.\)*](#). Sunderland, MA: Sinauer Associates.



- Please *skim chapters* before coming to class to facilitate the work we do in class.

TEXTBOOK WEBSITE: <http://7e.biopsychology.com/>

- This site includes *several useful tools* - study questions, online quizzes, flashcards, animations, etc. I highly suggest you use it frequently to stay on top of course terminology - there is a lot of it! ☺
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CLASS ASSIGNMENTS

- **EXAMS:** There will be two exams during the semester, plus a cumulative final. Exams will primarily consist of short answer questions, although a small number of diagram identifications, multiple choice, and “True/False? Explain” questions will be included on most exams. Questions will be based on assigned readings and material discussed in class and lab. Exams will be worth 75 points each, except the final, which will be worth 100 points (**250 points total**).
- **CASE STUDY DISCUSSION:** Students will work in groups of two or three to lead the class discussion on one neuropsychological/neurological disorder. Your Case Study Discussion should include *current research* on your topic and should not simply be a lecture to the class. You may use PowerPoint for key points, but should have *at least one activity* for the class to participate in that helps to illustrate and/or reinforce key aspects of the disorder. A handout further describing the Case Study Discussion is posted on Canvas. The assignment will be worth **50 points**.
- **PARTICIPATION:** All students are expected to come to every class and participate in class activities and discussions. Active engagement in class is a key factor in learning, and therefore, plays an important role in grades, especially when a student’s grade is borderline. For example, a student with an 89.9% who has consistently been an active participant in class will earn a final grade of A-, while a student with an 89.9% who missed several classes and/or didn’t actively participate when in class will receive a final grade of B+. ***Bottom line: Come to class prepared and be an active participant!***

LAB ASSIGNMENTS

- **NEUROANATOMY:** In conjunction with in-class discussions of human neuroanatomy, students will conduct a detailed dissection of the sheep brain. This dissection will culminate in a hands-on neuroanatomy exam that will be worth **75 points**.
 - **RESEARCH METHODS:** Discussion and practice of proper research methods will be examined throughout the semester. Topics will include ethics in research, best practices in experimental design and collecting data, and basic statistical analyses. Students will be assessed for their understanding of these concepts through their appropriate application to experiments run in lab and in-class exams.
 - **ARTICLE SYNTHESIS PAPERS:** To aid in the preparation of experiments and to hone your analysis and synthesis skills, students will complete two article synthesis papers. Twice during the semester, students will read two articles and write an analysis and synthesis paper that discusses questions/concerns you have with each paper and your synthesis of the findings from both papers. More details about this assignment will be discussed in lab. Article synthesis papers will be worth 10 points each (**20 points total**).
 - **EXPERIMENTS:** Students will work in pairs to conduct two experiments - one involving human participants, and one involving rat subjects. We will spend several weeks designing these experiments, collecting and analyzing data, and preparing research posters (that will be presented during lab). More details about this assignment will be discussed in lab. Final posters and presentations will be worth 50 points each (**100 points total**).
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GRADING

CLASS Assignments	Points	LAB Assignments	Points
Exam 1	75	Neuroanatomy Exam	75
Exam 2	75	Article Synthesis (10 points each)	20
Final Exam	100	Human Research Poster & Presentation	50
Case Study Discussion	50	Rat Research Poster & Presentation	50
Total	300	Total	195

Grade	%	Grade	%	Grade	%	Grade	%
A	94-100	B+	87-89	C+	77-79	D+	67-69
A-	90-93	B	84-86	C	74-76	D	63-66
		B-	80-83	C-	70-73	F	0-62

AN IMPORTANT NOTE ABOUT GRADING: A grade of “C” is indicative of “average” work in this class. If you want to earn an “A” (exceptional) or “B” (very good), then you need to work very hard AND produce stellar work. Based on past experiences with this course, students who earn better than average grades come to class consistently, are actively engaged, earn solid grades on exams, produce work that is well-thought-out and that involves a high level of intellectual sophistication, and consistently offer comments during class that enrich the discussion for everyone.

THE FINE PRINT

- **Arrive on time and be an active participant:** The best way to learn in this class is to be mentally and physically present for every minute of our class time together. It is in your best interest to arrive on time and not leave class during our sessions together (i.e., please take care of bathroom/water breaks prior to coming to class).
 - **Turn in assignments and take exams on time:** Be sure to plan accordingly so that you can turn in all assignments on time, and take exams as scheduled. *Late assignments will lose one letter grade per day*, and any *messed exams will result in a zero*. Students may make up missed exams, if they provide documentation to support their absence (e.g., notification from doctor of an illness, etc.). No supporting documentation for your absence will result in a zero on the exam. If you know that you will need to miss an exam for a legitimate reason (e.g., travel related to a class or sports), please let me know early, so that we can arrange for you to take the exam before you leave.
 - **Keep your cell phones OFF and packed away:** The use of cell phones during class is NOT permitted. It is incredibly disruptive to everyone when students interact with a cell phone during class. If you are expecting an urgent call/text, please let me know before class begins and I will be happy to make accommodations for the day. Students who use a phone during class will be asked to put it away; if this happens repeatedly, they will be asked to leave.
 - **Use laptops ONLY for taking notes:** Similar to the previous point, this should be obvious - using Snapchat or shopping during class is not an efficient use of our time together. I appreciate the value of using your laptop for taking notes, so am happy to allow students to use them during class; however, using laptops for anything other than taking notes will be disruptive and is not permitted.
 - **Show academic integrity in your work:** All tests and written assignments in this class are pledged work under the [Academic Integrity Code](#). I encourage you to study with other students in the class and to discuss class materials with other students. However, your *tests and written assignments should be your work alone*, unless otherwise specified. Furthermore, **plagiarism will not be tolerated**. Be sure to *paraphrase carefully* in your writing and *cite appropriately*, and as always, feel free to see me about appropriate citations, when needed. I'm happy to help. Students found to be breaking the AIC will receive a zero on the assignment/exam, be referred to the Dean for Academic Life, and depending on the circumstances, may receive a failing grade for the class. If you have any questions or concerns about how the AIC applies to work in this class, I will be happy to discuss this with you.
 - **If you have a documented disability, please let me know what I can do to facilitate your learning in this class:** Students requiring special accommodations for this course must first contact the Office for Disability Services (Director: Mrs. Pamela Moschini, Ext. 3825). Please provide me with the appropriate documentation and I will make every effort to work with you to facilitate your learning in this class.
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DISCUSSION AND READING OUTLINE

This is an approximate guide. Material may be added or deleted throughout the semester, as time permits. If changes are made, they will be announced in class, lab, or via email as soon as possible.

Day/Date	CLASS
W - Jan 18	Introduction to the Course <i>Neuroanatomy Assignment</i>
M - Jan 23	CH 1: Biological Psychology
W - Jan 25	CH 2: Functional Neuroanatomy
M - Jan 30	<i>Neuroanatomy Assignment Due</i> CH 2: Functional Neuroanatomy
W - Feb 1	CH 2: Functional Neuroanatomy
M - Feb 6	CH 4: The Chemistry of Behavior
W - Feb 8	CH 4: The Chemistry of Behavior
M - Feb 13	CH 17: Learning & Memory
W - Feb 15	CH 17: Learning & Memory
M - Feb 20	CH 17: Learning & Memory
W - Feb 22	<i>Exam 1: CH 1, 2, 4, 17</i>
M - Feb 27	CH 11: Motor Control and Plasticity
W - Mar 1	CH 11: Motor Control and Plasticity
M - Mar 6	SPRING BREAK: No Class
W - Mar 8	SPRING BREAK: No Class
M - Mar 13	CH 11: Motor Control and Plasticity
W - Mar 15	CH 15: Emotions, Aggression & Stress

Week of	LAB
Jan 16	Introduction to the Lab "Observe" your brain
Jan 23	No Lab
Jan 30	Sheep Brain Dissection <i>External Structures</i>
Feb 6	Sheep Brain Dissection <i>Internal Structures</i>
Feb 13	<i>Neuroanatomy Exam</i> <i>Includes sheep and human brain structures/concepts</i>
Feb 20	Experiment 1: Learning & Memory - HUMAN <i>Basics of BIOPAC [Moyer Hall 006]</i>
Feb 27	Experiment 1: RAT Experiment <i>Group Work on Experimental Design</i>
Mar 6	SPRING BREAK: No Class
Mar 13	Experiment 1: RAT Experiment <i>Data Collection and Analysis</i> <i>Discuss Article Synthesis Assignment</i>

M - Mar 20	CH 15: Emotions, Aggression & Stress
W - Mar 22	CH 16: Psychopathology
M - Mar 27	CH 16: Psychopathology
W - Mar 29	CH 19: Language & Hemispheric Asymmetry
M - Apr 3	CH 19: Language & Hemispheric Asymmetry
W - Apr 5	Exam 2: CH 11, 15, 16, 19
M - Apr 10	CASE STUDY DISCUSSIONS - Ogden <ul style="list-style-type: none"> CH 7: "Out of mind, out of sight: A case of hemineglect" - Rachel & Bailey CH 9: "The impaired executive: A case of frontal lobe dysfunction" - Erin & Ashley
W - Apr 12	CASE STUDY DISCUSSIONS - Ogden <ul style="list-style-type: none"> CH 6: "A body in the mind: A case of autotopagnosia" - Cam, Jamie, Michael CH 8: "Vision without knowledge: Visual object agnosia & prosopagnosia" - Jess & Taylor
M - Apr 17	EASTER BREAK: No Class
W - Apr 19	CASE STUDY DISCUSSIONS - Ogden <ul style="list-style-type: none"> CH 4: "Out of control: The consequences and treatment of

Mar 20	Article Synthesis Assignment Due Article 1: Nader et al. (2000) Article 2: Land et al. (2000) Experiment 1: RAT Experiment <i>Poster Guidelines and Work on Poster</i>
Mar 27	Experiment 2: RAT Experiment Poster Presentations
Apr 3	Finish Poster Presentations Discussion Article Synthesis Paper #1 , including Land et al. and Nader et al. articles Discuss Human/Biopac Experiment
Apr 10	EASTER BREAK: No Lab
Apr 17	Article Synthesis Assignment Due Article 1: Brunet et al. (2008) Article 2: James et al. (2015) Experiment 2: HUMAN Experiment <i>Data Collection & Data Analysis</i>

	epilepsy”
M - Apr 24	<p>CASE STUDY DISCUSSIONS - Ogden</p> <ul style="list-style-type: none"> • CH 11: “The unseen injury: Mild traumatic brain injury” - Chris & Katie • CH 15: “Mind over matter: Coping with Parkinson’s disease” -Monica & Tabitha
W - Apr 26	<p>CASE STUDY DISCUSSIONS - Ogden</p> <ul style="list-style-type: none"> • CH 16: “Huntington’s disease: A family challenged” - Karlee & Josh • CH 17: “Dementia: A family tragedy” - Jesse, Emily & Louisa
M - May 1	<p>CASE STUDY DISCUSSIONS - Ogden</p> <ul style="list-style-type: none"> • CH 12: “Explosions in the mind: A case of subarachnoid hemorrhage” - Nate & Jason • CH 14: “Tomorrow is another day: Living with multiple sclerosis”
W - May 3	Course Wrap-Up
	<i>Final Cumulative Exam: Case Studies and Cumulative Questions</i>

Apr 24	<p>Experiment 2: HUMAN Experiment</p> <p><i>Complete Data Analyses</i></p> <p><i>Work on Poster</i></p>
May 1	<p>Experiment 2: HUMAN Experiment</p> <p><i>Poster Presentations</i></p>