

Term Information

Effective Term Spring 2014

General Information

Course Bulletin Listing/Subject Area Psychology
Fiscal Unit/Academic Org Psychology - D0766
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 3313H
Course Title Introduction to Behavioral Neuroscience
Transcript Abbreviation Behav Neuroscience
Course Description Introduction to the structure and function of the nervous system in relation to behavior.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week, 7 Week, 4 Week (May Session), 12 Week (May + Summer)
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Lecture
Grade Roster Component Lecture
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus, Lima, Mansfield, Marion, Newark

Prerequisites and Exclusions

Prerequisites/Corequisites Prereq: 1100 (100) or 1100H (100H)
Exclusions Not open to students with credit for 3313 (313)

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 42.0101
Subsidy Level Baccalaureate Course
Intended Rank Freshman, Sophomore

Quarters to Semesters

Quarters to Semesters

New course

Give a rationale statement explaining the purpose of the new course

Psychology 3313 enrolls over 600 students per year. The course is one of two options for students in the Brain and Behavior core requirement area. Currently, we do not have any honors offerings in this area so we expect Psychology 3313H will be a st

Sought concurrence from the following Fiscal Units or College

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students will be able to think critically about theories that relate a brain structure or process with a mental or behavioral function.
- Students will be able to apply neuroscience concepts, theories and research findings to issues in everyday life.
- Students will be able to form reasoned positions about major issues related to the neuroscience
- Students will be able to know how to read and understand peer-reviewed neuroscientific research articles and compare that information with textbook and popular writing.

Content Topic List

- History of Mind-Brain studies
- Peripheral and Central Nervous System
- Neurons and Glia
- Synaptic Transmission
- Neurotransmitters Drugs and Hormones
- Methods of Brain Research
- Brain Development
- Vision and Visual Perceptio
- Auditory Processing
- Movement
- Emotion and Motivated Behavior
- Sleep and Dreaming
- Learning
- Memory
- Cerebral Asymmetry in Thinking
- Neurological and Psychological Disorders

Attachments

- Psych 3313 syllabus.pdf: non-honors syllabus
(Syllabus. Owner: Paulsen, Alisa Marie)
- Psychology 3313H Honors Proposal.docx: Honors Proposal
(Other Supporting Documentation. Owner: Paulsen, Alisa Marie)
- Psych 3313H syllabus.pdf: syllabus
(Syllabus. Owner: Paulsen, Alisa Marie)

Comments

- Revised syllabus is attached. Enrollment limit will be set at 30. There are faculty who currently teach Psych 3313 on some regional campuses and they would be able to teach Psych 3313H as well, if desired. *(by Paulsen,Alisa Marie on 10/04/2013 10:19 AM)*
- Please see email *(by Hogle,Danielle Nicole on 09/27/2013 02:12 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Paulsen,Alisa Marie	04/18/2013 02:54 PM	Submitted for Approval
Approved	Nygren,Thomas Eugene	04/22/2013 11:34 AM	Unit Approval
Approved	Haddad,Deborah Moore	04/22/2013 01:53 PM	College Approval
Revision Requested	Hogle,Danielle Nicole	09/27/2013 02:13 PM	ASCCAO Approval
Submitted	Paulsen,Alisa Marie	10/04/2013 10:20 AM	Submitted for Approval
Approved	Vasey,Michael William	10/07/2013 05:08 PM	Unit Approval
Approved	Haddad,Deborah Moore	10/07/2013 05:31 PM	College Approval
Pending Approval	Vankeerbergen,Bernadette Chantal Nolen,Dawn Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole Hanlin,Deborah Kay	10/07/2013 05:31 PM	ASCCAO Approval



Honors Behavioral Neuroscience

PSYCHOLOGY 3313H

Credit: 3 hours; Class #
Time: TTh: 12:45 – 2:05 PM
Place:

Instructor: Dr. Ben Givens
55 PS;292-0385
givens.7@osu.edu

I. COURSE SUMMARY

This honors course explores the relationship between the brain and behavior. Truly, in order to understand our thoughts and behavior, it is necessary to understand the brain. The primary course objective is to introduce terminology and concepts that will allow you to begin to understand how behavior and cognitive function could arise from interactions between groups of neurons. My hope is that in this course you will not only become familiar with the "nuts and bolts" of how the brain works, but also become fascinated by its complexity and elegance, and its awesome ability to bring into existence all of your thoughts, memories, dreams, and hopes.

The course is divided into three major sections. The first section is organized around the general structure and function of the nervous system. In this section, we will begin by exploring the anatomical organization of the nervous system at both the cellular and systems level, followed by a discussion of the physiology (electrical and chemical) of neural communication within and between neurons. We will round out these beginnings by considering neuroendocrine systems, synaptic pharmacology of psychoactive drugs, and the genetics and development of the nervous system. The second section of the course will explore sensory and motor systems, with an in depth investigation of the visual system from retinal processes to complex perception. The third section will examine several domains of behavioral and cognitive functions and dysfunctions, from biological rhythms and sleep, to stress and emotions, to learning and memory, to neurological and psychological disorders.

II. LEARNING OBJECTIVES

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

- understand the role of subcortical brain regions, including the basal ganglia, thalamus, hypothalamus, brainstem nuclei, cerebellum and spinal cord in overall brain function.
- describe the functional organization of the cerebral cortex
- describe how and where information flows through the cerebral cortex
- understand how individual neurons receive and send information
- provide specific details about the role of the peripheral nervous system in providing afferent data to the brain as well as carrying out efferent commands to muscles and organs.
- explain the process of synaptic transmission
- describe similarities and differences between the six major neurotransmitters, and how drugs interact with these transmitter systems.
- identify methods of investigation used to study the brain.
- describe how visual images are processed by the eye and be able to trace the pathways by which visual images are processed in the brain.

- describe how sounds are processed in the ear and be able to trace the pathways by which sounds are processed in the brain.
- trace the various pathways that are involved with movement and understand how each motor –related brain structure adds something different to the final output.
- recognize the various stages of the sleep cycle and identify the neural basis for each.
- understand how hormones impact human behavior.
- know how different emotions engage different parts of the brain and how these brain structures contribute to various cognitive functions.
- differentiate among the different types of learning and memory and understand the brain mechanisms responsible.
- know the various neurological disorders and the brain mechanisms thought to be responsible for the symptoms as well as the latest approaches to treatment.
- identify the brain pathology underlying different psychological disorders.

In addition, by participating in discussions and presenting to the group, students will be able to:

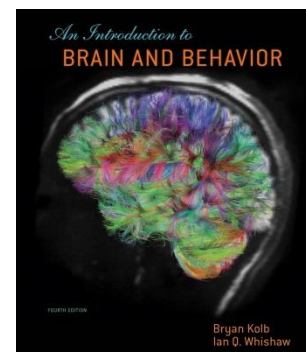
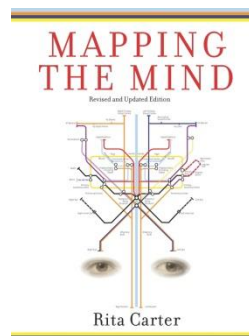
- think critically about theories that relate a brain structure or process with a mental or behavioral function.
- apply neuroscience concepts, theories and research findings to issues in everyday life.
- form reasoned positions about major issues related to the neuroscience
- know how to read and understand peer-reviewed neuroscientific research articles and compare that information with textbook and popular writing.

II. RESOURCES

Textbook: The course textbook is *An Introduction to Brain and Behavior*, 4th ed. by Kolb and Whishaw, Worth Publishers, 2014. This is a very readable text that provides all of the basic information that you will need for this course. A copy of the course textbook will be on reserve at main library. In addition, we will read a paperback called *Mapping the Mind* by Rita Carter, UC Press, 2010. This thought-provoking book will be discussed at bi-weekly sessions.

Websites: The course website can be found at www.carmen.osu.edu. This site is where all course materials and information are made available. Most important are the lecture files. Each lecture is available in both PowerPoint and Acrobat (.pdf) format. Printing these out and reviewing them prior to each class is invaluable for success in this course. There are many websites on the internet that provide useful information about behavioral neuroscience, perhaps none more so than “Neuroscience for Kids” at <http://faculty.washington.edu/chudler/introb.html>

Assistance: I am available and interested in talking with you about the course, the course material, and strategies to improve your learning. I’m usually available after class, can answer questions by e-mail (givens.7@osu.edu) or phone (292-0385), and will gladly set up an appointment at a time that is mutually acceptable for more lengthy discussions.



III. LECTURE AND READING SCHEDULE

WEEK	DATES	TOPICS	CHAPTER*
1	Jan. 8 Jan. 10	Introduction and History of Mind-Brain studies Peripheral Nervous System	1 2
2	Jan. 15 Feb. 1	Central Nervous System Discussion/Presentations	2 1 (MM)
3	Feb. 6 Feb. 8	Neurons and Glia Action Potentials	3 4
4	Feb. 13 Feb. 15	Synaptic Transmission Discussion/Presentations	5 2 (MM)
5	Feb. 20 Feb. 22	Neurotransmitters Drugs and Hormones Methods of Brain Research	6 7
6	Feb. 27 Mar. 1	Discussion/Presentations/Review Exam 1	3 (MM)
7	Mar. 6 Mar. 8	Brain Development Vision and Visual Perception	8 9
8	Mar. 13 Mar. 15	Auditory Processing Discussion/Presentations	10 5 (MM)
9		Spring Break	
10	Mar. 27 Mar. 29	Movement Emotion and Motivated Behavior	11 12
11	Mar. 6 Mar. 8	Sleep and Dreaming Discussion/Presentations/Review	13 4 (MM)
12	Mar. 13 Mar. 15	Exam 2 Learning	14
13	Mar. 6 Mar. 8	Memory Discussion/Presentations	14 7 (MM)
14	Mar. 13 Mar. 15	Cerebral Asymmetry in Thinking Neurological Disorders	15 16
15	Mar. 6 Mar. 8	Psychological Disorders Discussion/Presentations/Review	16 8 (MM)
16		Final Exam	

* textbook chapter numbers; numbers followed by (MM) are from the paperback Mapping the Mind.

IV. EXAMS and GRADING

There will be three exams in this course. Each exam will consist of 40 multiple choice questions and two 5 point short answer questions. The first two exams are sectional, only over the material covered since the last exam, and the final also contains a sectional exam (~70%). However, a portion (~30%) of the final is comprehensive over some of the material covered in the first exam. This early material is tested twice because it is considered to be critically important for your long term understanding of how the brain works. Each of the three tests is weighted equally, worth 100 points each, so that the final grade is out of 300 points. In addition, there will be a written summary and presentation of a research article (50 pts), and an additional 50 points will be given based on class participation in discussion of topical papers and readings,

including the Mapping the Mind paperback. The total number of points for the course is 400 points. The details of the research article summary and presentation are described in a separate document.

All of the material that is tested on the exams comes from lecture, so it is in your best interest to attend all lectures. As a suggestion, you should make the acquaintance of others in the class, so that you can get class notes in the event that you miss a class.

Research Article Summary and Presentation

In the field of behavioral neuroscience, there are hundreds of journals each with dozens of research articles published weekly. In order to keep up with the field, it is important to be able to quickly glean pertinent information from articles of interest. To develop your skill at abstracting information from research articles, your assignment is to summarize the different components of a research article (see bibliography of representative articles). You should be able to do this in 1-2 single-spaced pages.

The grade for the research article summary (25 pts) will be based on how well you address the following questions:

- | | |
|----------------|--|
| Introduction - | What is the basic theory under examination? What is the specific hypothesis being tested? |
| Methods - | What is the experimental design. What are the control groups? What experimental techniques are used? |
| Results - | What are the results? Is there a significant difference between the experimental and control group, or a significant correlation between the critical variables? |
| Discussion - | Was the original hypotheses confirmed? Does the new information fit with previous findings on this topic? |
| Evaluation - | Were the experiments well controlled? Did they address the hypothesis? Are there alternative explanations for the results? |

The research article that you summarize in writing is also to be presented to the class. The presentation should last approximately 10 minutes. It should begin with a statement of the problem/issue that is addressed by the experiment and the specific hypothesis being tested. The research methods and the design of the study should be briefly described. Schematics are particularly helpful for this purpose. The main findings in the study are then presented and carefully explained using the most relevant figures and/or tables from the article. Finally, you should discuss how these new data refine or extend our understanding of the hypothesis/theory being tested. The grade for the presentation (25 pts) will be based on how effectively you convey the information on these different components of the article.

V. Students with disabilities

This syllabus is available in alternative formats upon request. In addition, if you may need an accommodation based on the impact of a disability, you should contact the instructor immediately. Students with special needs should contact the Office of Disability Services (ODS) at 292-3307 for certification if they have not already done so. Upon such certification, the ODS

and the instructor will make every effort to accommodate special needs. However, to ensure that evaluation of student performance in the course is conducted in a manner that is fair to all students, special accommodations will not be granted in the absence of ODS certification.

VI. Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

VII. Bibliography of representative research articles:

Redcay, E., Dodell-Feder, D., Pearrow, M.J., Mavros, P.L., Kleiner, M., Gabrieli, J.D.E. and R. Saxe. Live face-to-face interaction during fMRI: A new tool for social cognitive neuroscience. *NeuroImage* 50 (2010) 1639–1647.

Wagner, U., Karim N.'D., Ethofer, T. and P. Vuilleumier. Guilt-Specific Processing in the Prefrontal Cortex. *Cerebral Cortex* 21 (2011) 2461—2470.

Sharot, T., Korn, C.W. and R.J. Dolan. How unrealistic optimism is maintained in the face of reality. *Nature Neuroscience* 14 (2011) 1475-1481.

Cohen D.A., and E.M. Robertson. Preventing interference between different memory tasks. *Nature Neuroscience* 14 (2011) 953-955.

MacEvoy, S.P. & R.A. Epstein Constructing scenes from objects in human occipitotemporal cortex. *Nature Neuroscience* 14 (2011) 1323-1331.

Wokke, M.E., van Gaal, S., Scholte, H.S., Ridderinkhof, K.R. and V.A.F. Lamme. The Flexible Nature of Unconscious Cognition. *PLOS* 6 (2011) (9) 1-7

8:00 – 9:20 am, T & Th, Lazenby Hall, Room 21

Instructor: Dr. Gary L. Wenk, Professor, Departments of Psychology & Neuroscience

Office Hours: T & Th 1-2 pm, Room 047

Text: Discovering Biological Psychology, L.A. Freberg, Wadsworth & Co.

<u>Order of Topics:</u>	<u>Assigned Reading: Chapter</u>
Brain Anatomy	2 & 3
Electrophysiology	3
Neurochemistry & Pharmacology	4
Development	5
Sleep and circadian rhythms	11
Hypothalamus and Feeding Behavior	9
Limbic system and emotions	14
Learning and memory	12
Motor systems	8
Vision, Hearing, Smell, taste and touch	6 & 7
Brain Disorders	15 & 16

Two Exams (September 27th & November 8th) and the Final Exam (December 11th @ 8 am) will determine your grade. The Final Exam is cumulative.

NO EXTRA CREDIT WILL BE GIVEN FOR ANY REASON.

Course format: Students are responsible for knowing and understanding the content of the readings and the lectures.

Final Grade determination: The best grade (i.e. the person with the highest total score) in the class will be the top of the "A" range. The other scores will be curved from this highest score, e.g. top 10% = A, next 10% = B, etc. Therefore, it is possible that the entire class could receive an "A."

Grades of Incomplete will be awarded only at the end of the quarter and not on account of disappointing performance. Students who are doing poorly in the course should drop it or withdraw (taking a grade of W) before the OSU deadlines for those actions.

Disabilities Statement:

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Academic Misconduct:

All students at the Ohio State University are bound by the Code of Student Conduct (see http://studentaffairs.osu.edu/pdfs/csc_12-31-07.pdf). Violations of the code in this class will be dealt with according to the procedures detailed in that code. Specifically, any alleged cases of misconduct will be referred to the Committee on Academic Misconduct. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct. For good, concise, plain-English advice on how to stay out of academic trouble, see Ten Suggestions for Preserving Academic Integrity at <http://oaa.osu.edu/coam/ten-suggestions.html>

Psychology 3313H is an honors version of our popular and widely enrolled course, Psychology 3313, Introduction to Behavioral Neuroscience, which is offered to over 600 students each year. This course is a required course in the new Neuroscience major, and as such has enrolled many new honors students. Neuroscience is one of the fastest growing fields of science and has attracted many of the brightest students who want to pursue a career in this exciting growth area. Students interested in neuroscience tend to be very well prepared, in fact over-prepared for the current offering which needs to remain accessible to Psychology majors who may not have a strong background or interest in a biological approach to Psychology. An honors course in Behavioral Neuroscience is long overdue, and will undoubtedly fill a strong need.

The Honors version of this course will differ from the non-honors version by offering more current and breaking research findings and fitting those discoveries into the basic information provided by the course textbooks and lectures. These new research findings will be used as examples within the regular class presentations by the instructor, but importantly, will also be highlighted and integrated by student presentations and discussions that will occur every other week of the semester. Additionally, the students will read a popular and thought-provoking paperback, the Mapping of the Mind, by Rita Carter, a science journalist, that will also be discussed at the bi-weekly discussion sessions. This is a radical departure from the non-Honors versions of the course, and frankly, couldn't be done in the typical class size for that course of 120-140 students.