

**Psyc 325 (CRN31986) Advanced Behavioral Neuroscience + Lab (CRN31987) /
Psyc 625 (CRN31989) Advanced Psychobiology**

Lecture: Tues & Thurs 3:30-4:50, BSS420, Lab: Tues 5-6:50, BSS 420

Prof: Ethan Gahtan Email: eg51@humboldt.edu (preferred) Tel: x4545

Office hours: 10:30am-11:30, Mon-Thurs, BSS 428 (office) or 122 (lab)

Teaching Assistant: Brian Griffiths: brian@bbg2.com

The brain is wider than the sky / For, put them side by side / The one the other will include / With ease, and you beside.

The brain is deeper than the sea / For, hold them, blue to blue / The one the other will absorb / As sponges, buckets do.

The brain is just the weight of God / For, lift them, pound for pound / And they will differ, if they do / As syllable from sound. - Emily Dickinson (1830-86)

COURSE DESCRIPTION

Behavioral Neuroscience is the study of the biological basis of the mind and behavior. This upper level lab course will start with a review of fundamental principles of biology, neuroscience, and behavior.

Selected topics will then be covered in more detail, including: Neurophysiology, Psychopharmacology, Sensory and Motor systems, Hormones, and Addiction. We will read original research articles along with the textbook to examine each main topic in more depth.

There is a weekly lab meeting which is required for undergraduate students. Labs will include activities on brain anatomy, perception, research design. The lab syllabus is provided as a separate document.

REQUIRED MATERIALS

1) Biological Psychology- An Introduction to Behavioral and Cognitive Neuroscience, *Fourth Edition*. Rosenzweig, Breedlove, and Watson. Sinauer Associates, 1994.

2) Moodle: Readings, assignments, activities will be posted on the course Moodle site: learn.humboldt.edu

STUDENT RESPONSIBILITIES AND GRADING - Undergraduate students:

You get a single grade for lecture and lab, but the activities and scoring for the lecture and lab are separate until final grades are calculated. The lecture grade will account for 2/3 of your total score and the lab grade for 1/3. The grade breakdown below pertains to the lecture portion only.

Exams: There are 4 in-class exams, worth 15% each, and a final exam worth 25% of your total grade. The final is cumulative. There will be exam review sheets distributed before each exam, and the TA will hold review sessions. Late exams will not be offered unless you provide prior notice of your absence.

In-class assignments: There will be 5 assignments. Each assignment is worth 3.75% of your total grade (15% overall for assignments). Assignments may take the form of homework, in-class question sets, short group projects, or other formats. There will be one assignment per section. No make ups for late assignments.

Lecture, Participation: can help your grade. Questions and comments are encouraged and expected.

Attendance: Attendance will be taken at every meeting. You're allowed 4 unexcused absences with no penalty. For every unexcused absence after your fourth, your final grade will be reduced by one letter grade. If you skip a class, it is your responsibility to get the notes from a classmate.

Grading:

Exams 1-4: 15% each 60%

Final Exam: 25%

In-class assignments: 15%

A range: ≥ 90 , B range: $\sim 89-80$, C range: $\sim 79-70$

STUDENT RESPONSIBILITIES AND GRADING - Graduate Students

You will participate in all of the activities of the lecture portion of the course, and you will have an additional final project consisting of an in-class presentation and research paper (described below).

Graduate students are NOT required to participate in the labs. However, you may choose to participate in the lab portion of the course for your own interest. Credit for lab participation cannot be offered to graduate students because scheduling conflicts may prohibit some of you from attending. Lab work of graduate students who choose to participate will not be graded.

Exams: There are 4 in-class exams, worth 12.5% each, and a final exam worth 20% of your total grade. These will be the same exams as for the undergraduates. The final is cumulative. Review sheets will be distributed before exams. Late exams will not be offered without prior notice of your absence.

In-class assignments: There will be 5 assignments. 1 assignment will be coming up with questions for student presenters - the same assignments as for undergraduates. Each assignment is worth 2% of your total grade (10% overall for assignments). Assignments may take the form of homework, in-class question sets, short group projects, or other formats. There will be one assignment per section. No make ups for late assignments.

In-class presentation and final paper: Both of these projects will be based on a single literature review and will given a single grade worth 20% of overall course points. The literature review must conform to the following specific guidelines. You will select two, related research articles from the Journal of Neuroscience, on the basis of your own interests and contingent upon my approval. As you work to understand these articles in preparing your presentation and paper, you will have many questions and will need to consult additional sources for background information. Find at least 3 additional sources (journal articles or text books) to answer at least 3 of your background questions. The paper should be 3-5 pages typed, double spaced, and contain the following: your name, paper title, and at least 3 subject headings with at least 1 paragraph per subject (for example: subsection 1: Background on Diffusion Tensor Imaging, subsection 2: DTI indexes of white matter volume are correlated with intelligence, subsection 3: the potential of DTI for neuroscience research and medical diagnosis), a summary statement (something like, "In summary, this paper has shown that DTI reveals new information about brain structure and function that is not obtainable with traditional MRI scans," etc...), and a full bibliography. Evaluation of papers will be based on the sophistication of the scientific content, clarity of writing and explanations, adherence to the guidelines, explication of a coherent theme that runs throughout the paper, and spelling, grammar and style.

Participation: can help your grade.

Attendance: Attendance will be taken at every meeting. You're allowed 4 unexcused absences with no penalty. For every unexcused after your fourth one, your final grade will be reduced by one letter grade. If you skip a class, it is your responsibility to get the notes from a classmate.

Grading:

Exams 1-4: 12.5% each 50%

Final Exam: 20%

In-class assignments: 10%

In-class presentation & paper 20%

A range: ≥ 90 , B range: $\sim 89-80$, C range: $\sim 79-70$

ALL STUDENTS - Additional critical information - read carefully

Students with Disabilities: Persons who wish to request disability-related accommodations should contact the Student Disability Resource Center in House 71, 826-4678 (voice) or 826-5392 (TDD). Some accommodations may take up to several weeks to arrange. <http://www.humboldt.edu/~sdrc/>

Add/Drop policy: Students are responsible for knowing the University policy, procedures, and schedule for dropping or adding classes. <http://www.humboldt.edu/~reg/regulations/schedadjust.html>

Emergency evacuation: Please review the evacuation plan for the classroom (posted on the orange signs) , and review

http://studentaffairs.humboldt.edu/emergencyops/campus_emergency_preparedness.php for information on campus Emergency Procedures. During an emergency, information can be found campus conditions at: 826-INFO or www.humboldt.edu/emergency

Academic honesty: Students are responsible for knowing policy regarding academic honesty:

http://studentaffairs.humboldt.edu/judicial/academic_honesty.php or

<http://www.humboldt.edu/~humboldt/catalogpdfs/catalog2007-08.pdf>

Attendance and disruptive behavior: Students are responsible for knowing policy regarding attendance and disruptive behavior: http://studentaffairs.humboldt.edu/judicial/attendance_behavior.php

COURSE CALENDAR – READING AND EXAM DATES

RBW = course text book; Readings are either text book pages or hyperlinks to posted articles

SECTION 1 – Theoretical Basis of Beh Neuro; Neurophysiology; Microcircuits; neurochemical signaling. Instructors: Griffiths, Gahtan		
Jan 19	Course intro; Beh Neuro & Evolution	
Jan 21	Finish Evolution Begin review of neurophysiology	RBW Ch.6 RBW P49-82
Jan 26	Finish neurophysiology; Calculate Nernst-Goldman Eq, *Hand in for assignment in class*; try online simulator .	Nernst Equation Article
Jan 28	Assembly of neurons into functional microcircuits	Text 83-88; 284-287
Feb 2	CLASS AND LAB CANCELED - Furlough cancellation	
Feb 4	Neurochemical signaling: hormones; focus on adrenal steroids	RWB Ch4 pages: Ch5 pages:
Feb 9	Catch up and review of section 1	
Feb 11	Exam 1	
SECTION 2 – 1. Neurobiology of sexual function, 2. Mirror neurons, 3. Neurogenesis, Language, higher cognition. Instructor: Gahtan		
Feb 16	Neurobiology of sexual function	Article
Feb 18	**NO CLASS MEETING - INSTRUCTORS AT AAAS IN SAN DIEGO** Assignment: listen to the latest neuropod episode and generate at least 2 questions or comments on any neuropod stories	<-- assignment
Feb 23	Mirror Neurons (article) ; Assignment: Report on 2 abstracts from either Journals Soc Cogn Affect Neuro or Soc Neuro	Article
Feb 25	Exercise: neurobiological effects (article) Stem cell therapy for neurodegenerative disease *Note Theo Palmer visit and lecture Feb 26*	Exercise article Stem cell therapy
Mar 2	Neurobiology of Language & Higher cognition 1	RWB 582-602
Mar 4	Neurobiology of Language & Higher cognition 2	RWB 602-614
Mar 9	CLASS AND LAB CANCELED - Furlough cancellation	Exam review sheet
Mar 11	Exam 2	
SECTION 3 – Auditory Neurobiology. Instructor: Griffiths, Gahtan		
Mar 23	Sound waves, Anatomy, Physiology, Pathways	RBW 248-258
Mar 25	finish physiology and pathways, vestibular system	
Mar 30	pitch discrimination, sound localization, plasticity	RBW 259-264
Apr 1	language, music, hearing loss, treatment	RBW 264-267
Apr 6	Catch up and review of section 3	
Apr 8	Exam 3	

SECTION 4 – Topics in neuropsychiatry. Instructor: Gahtan		
Apr 13	Psychogenic Stress 1: evolutionary origin, acute stress physiology, role of memory, stress and psychiatric disease	Stress1-article
Apr 15	Psychogenic Stress 2: genetic risk factors and their molecular mechanisms	Stress2-article
Apr 20	Drugs1: Drugs of abuse, neural systems perspective	RWB p107-117 Drugs1-article
Apr 22	Drugs2: focus non cannabinoids	Drugs2-article
Apr 27	Drugs 3: nootropic drugs for neuroenhancement	Drugs3-article
Apr 29	Consciousness, Dennett lecture ; review for exam 4	
May 4	Exam 4	
May 6	Review for final exam	
Final Exam	Thursday, May 11 th 3-4:50PM in BSS 420	