



# Neural Basis of Behavior

BIOL-383-001 / BIOL-383-H01 Fall 2015  
 Monday Thursday; 2:30PM – 3:55PM  
 @ CKB341



**Instructor:**

**Gal Haspel** [haspel@njit.edu](mailto:haspel@njit.edu)

Thursday 1:30-2:30 pm and by appointment.

How does the brain control behavior? To answer this rather broad question, we will explore how scientists study and understand behavior and in turn develop hypotheses, predictions and experiments that reveal the neural mechanisms for specific behaviors. We will review and discuss several “model animal systems” in which scientists have had remarkable success in understanding the interplay between neural mechanisms and behavior.

Each subject will be covered in two or three lectures and conclude with at least one and up to three student’s presentations of individual topic. Between subjects (usually over the weekend), students will submit “tweets” that will summarize another student’s presentation, a concept of one of the lectures or the whole subject.

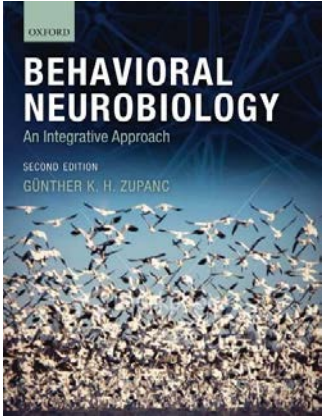
Course prerequisites: or permission from instructors.

**Course outline:**

Dates	Topics	Text	Notes
R Sep. 3 <sup>rd</sup>	Introduction		
T Sep. 8	Skills: Presentation and scientific method		
R Sep. 10	Review of neurophysiology		
M Sep. 14	Sensory modalities: lateral line		
R Sep. 17	Sensory modalities: Hearing and Echolocation	Ch. 5	
M Sep. 21	Sensory modalities: vision		
R Sep. 24	Motor control: reflexes, oscillators		
M Sep. 28	Motor control: CPG, locomotion		
R Oct. 1 <sup>st</sup>	Motor control: locomotion		
M Oct. 5	Startle and escape response: introduction and C-startle in fish	Ch. 6	
R Oct. 8	Startle and escape response: squid cockroach fly		
M Oct. 12	Sensory processing: barn owl	Ch. 7	
R Oct. 15	Sensory processing: Toad		
M Oct. 19	Sensorimotor: electric fish	Ch. 8	
(SfN)			
R Oct. 22	Sensorimotor: electric fish		
M Oct. 26	Clocks and rhythms	Ch. 10	
R Oct. 29	<i>Midterm exam</i>		
M Nov. 2 <sup>nd</sup>	Navigation and migration	Ch. 11	
R Nov. 5	Navigation and migration		
M Nov. 9	Communication and song: cricket and others	Ch. 12	
R Nov. 12	Communication and song: songbirds		
M Nov. 16	Neuromodulation and hormones	Ch.9	
R Nov. 19	Learning and memory	Ch. 13	

<b>(ISU)</b>	
<b>M Nov. 23</b>	Student presentations
<b>M Nov. 30</b>	Student presentations
<b>R Dec. 3<sup>rd</sup></b>	Student presentations
<b>M Nov. 7</b>	Student presentations
<b>R Dec. 10</b>	(Last day of classes): Review for exam
<b>Dec. 15-21</b>	<i>Final exam</i>

**Textbook:** Behavioral Neurobiology: An Integrative Approach (2<sup>nd</sup> edition)  
 by GKH Zupanc  
 ISBN-13: 978-0199208302 ISBN-10: 0199208301



**Grading:** 10% Quizzes and Moodle tasks (for example, pseudotweets (A short message of max 140 characters, including spaces, submitted at the end of each subject. #likethisexample #120char) and suggested exam questions)  
 20% Midterm exam  
 30% Presentation / Paper / Discussion  
 40% Final exam

Grading Scale	
A	88-100
B+	81-87
B	74-80
C+	67-73
C	60-66
D	50-59
F	0-49

**Learning expectations and assessment:**

This course is a “curiosity-based” exploration of the relationships between neural mechanisms and behavior. It does not teach specific skills or information that are critical for any subsequent career or course – rather, its goal is to satisfy students’ inherent curiosity about animal behavior and the neural systems that underlie it.

The course has two primary teaching goals:

The first goal is to *expose students to some of the best examples of the neuroethological approach to the study of the mechanisms of behavior.* This will be assessed using open-book exams in which students will be asked to explain scientific and biological strategies, conceptual organization, and detailed features of these examples.

The second teaching goal is to *provide students with the tools to explore their own interests in the behavioral neurosciences*. The student and professor will agree on a topic of each student's choosing that will allow them to explore their own interests related to the course. The last few lectures and, when appropriate, a portion of the final lecture of each subject is dedicated to student presentations. Each student will present a 15 min talk about their topic. Honor students (and optional for others) will also submit a term paper summarizing the research. Non-honors students will also be encouraged to write a paper but a formal paper will not be required. Even if these students do not write a paper, they will be required to meet with the professors to discuss readings of their choosing. Improving presentation and writing skills are objectives of the course and students are advised to begin working on a paper and a presentation early. Professional support on writing can also be provided by the NJIT writing center: <http://humanities.njit.edu/writingcenter/>

**Class Policies:**

Cell phones: The use of cell phones during class or exam times is prohibited.

Makeup Exam Policy: There will be no makeup exams, except in rare situations where the student has a legitimate reason for missing an exam, including illness, death in the family, accident, requirement to appear in court, etc. The student must notify the Biological Sciences office and the Instructor that he/she will miss an exam. In all cases, the student must present proof for missing the exam TO THE DEAN OF STUDENTS OFFICE, e.g., a doctor's note, police report, court notice, etc., clearly stating the date and times.

Academic Integrity: Students are reminded of the Honor Code each one has agreed to abide by (at Rutgers or NJIT). Violations of Academic Integrity will be dealt with according to the guidelines indicated in the NJIT Academic Honor Code (<http://integrity.njit.edu/index.html>). Please re-read Article III of the Honor Code (page 4), which describes conducts that are considered unacceptable (cheating, violating the US Copyright law, etc.). Rutgers has similar rules (<http://www.ncas.rutgers.edu/oas/ai>). All submitted material will be scanned for plagiarism by Turnitin.