

# Neuroscience 1 (NEUR0010)/ Semester I 2013

## An Introduction to The Nervous System

<u>Session</u>	<u>Date</u>	<u>Lecture topic</u>	<u>Lecturer</u>	<u>Reading</u>
<b>PART 1: NEURONS and ANATOMY</b>				
1	Th, Sept. 5	Introduction / Neurons and glia	<b>Stein</b>	Ch 1, 2
2	Tu, Sept. 10	Neurophysiology 1: resting membrane potential	<b>Paradiso</b>	Ch 3
3	Th, Sept. 12	Neurophysiology 2: action potential	<b>Paradiso</b>	Ch 4
4	Tu, Sept. 17	Synaptic transmission 1: physiology	<b>Bowen</b>	Ch 5
5	Th, Sept. 19	Synaptic transmission 2: chemistry	<b>Bowen</b>	Ch 6
6	Tu, Sept. 24	Organization of the vertebrate brain 1	<b>Stein</b>	Ch 7
7	Th, Sept. 26	Organization of the vertebrate brain 2	<b>Stein</b>	Ch 7
8	Tu, Oct. 1	<b>Exam 1</b> covers Sept. 5 to Sept. 26; 25% of course grade		
<b>PART 2: NEURAL SYSTEMS</b>				
9	Th, Oct. 3	Vision 1: the eye	<b>Paradiso</b>	Ch 9
10	Tu, Oct. 8	Vision 2: thalamus and V1 cortex	<b>Paradiso</b>	Ch 10
11	Th, Oct. 10	Vision 3: beyond V1	<b>Paradiso</b>	Ch 10
12	Tu, Oct. 15	Audition 1: the ear	<b>Simmons</b>	Ch 11
13	Th, Oct. 17	Audition 2: central pathways	<b>Simmons</b>	Ch 11
14	Tu, Oct. 22	Somatic Sensation 1: touch and pressure	<b>Stein</b>	Ch 12
15	Th, Oct. 24	Somatic Sensation 2: pain and temperature	<b>Stein</b>	Ch 12
16	Tu, Oct. 29	Motor system 1: muscle and spinal cord	<b>Connors</b>	Ch 13
17	Th, Oct. 31	Motor system 2: central control	<b>Connors</b>	Ch 14
18	Tu, Nov. 5	<b>Exam 2</b> covers Oct. 3 to Oct. 31; 25% of course grade		
<b>PART 3: BRAIN AND BEHAVIOR</b>				
19	Th, Nov. 7	Chemical control of brain and behavior	<b>Paradiso</b>	Ch 15
20	Tu, Nov. 12	Motivation	<b>Mcllwain</b>	Ch 15, 16
21	Th, Nov. 14	Mental Illness	<b>Stein</b>	Ch 22
22	Tu, Nov. 19	Memory 1: vertebrate models of memory	<b>Bear</b>	Ch 25
23	Th, Nov. 21	Memory 2: memory systems and amnesia	<b>Paradiso</b>	Ch 24
24	Tu, Nov. 26	Brain rhythms & sleep	<b>Paradiso</b>	Ch 19
25	Th, Nov. 28	Thanksgiving		
26	Tu, Dec. 3	Brain plasticity	<b>Linden</b>	TBA
27	Th, Dec 5	Addiction	<b>Kauer</b>	Ch 15, 16
28	Tu, Dec 10	Sex and the Brain	<b>Paradiso</b>	Ch 17

**W, Dec. 18** **FINAL EXAM 2-5pm** covers material from entire semester  
50% of course grade

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## An Introduction to The Nervous System

### I. GOALS

- To provide a systematic introduction to the mammalian nervous system, emphasizing the structural and functional organization of the human brain and the relationships between brain, perception, and behavior.
- To expose students to the field of neuroscience and some of the neuroscientists at Brown.

### II. CONTENT

This course begins with the study of nerve cells: their structure, the propagation of nerve impulses and transfer of information between nerve cells, the effect of drugs on this process, and the development of nerve cells into the brain and spinal cord. We then move to the sensory systems such as hearing, vision and touch and discuss how physical energy such as light is converted into neural signals, where these signals travel in the brain and how they are processed. Next we study the control of voluntary movement. Finally, we cover the neurochemical bases of brain diseases and those systems that control sleep and consciousness, emotion, learning and memory and addiction.

### III. PREREQUISITES

There are no prerequisites for Neuro 1 although a *background in high-school or college biology and chemistry is assumed*.

### IV. ORGANIZATION

#### A. Lectures

All lectures will be given in Salomon Auditorium starting promptly at 1 PM on Tuesday and Thursday. *Since the lectures comprise the major body of knowledge upon which you will be examined, attending lecture is imperative.*

#### B. Text

*Neuroscience: Exploring the Brain, Third Edition* by Bear, Connors and Paradiso. The text is available at the Brown University Bookstore. The reading assignments are substantial; do not put them off until just before an exam!

#### C. Weekly Sections

Each student will be assigned to a weekly recitation section led by two teaching assistants. Although these sections are not mandatory, we strongly encourage you to attend them. Sections will start the second week of class, and will be held from 7 to 8 PM and 8:30 to 9:30 PM Tuesday, Wednesday, and Thursday. Section signup and meeting rooms will be announced in class. You will be able to change sections as long as there is space and the teaching assistants approve.

#### D. Exam Review Sessions

Regular recitation sections will not meet the weeks that midterm exams are held. Instead, there will be review sessions on Sunday and Monday nights 7 – 9 pm prior to the midterm exams that occur on Tuesdays. On the Sundays and Mondays prior to the midterm exams, TAs will also be stationed in the Mezzanine of the Science Library from 9 – 11 pm to answer questions.

#### E. Questions, Office Hours, Resources

On the MyCourses web pages you will find a copy of the syllabus, information about lectures, exam schedules and grades. Whenever possible, we also post a pdf or powerpoint file for each lecture.

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Discussion group: On the MyCourses Discussion Group you can post questions that will be answered by TAs, professors, and maybe other students in the class. We also use the Discussion Group to post corrections or supplements to lectures. There is also a Neuro 1 website with additional helpful information:

<http://www.brown.edu/Courses/BN01/>.

Office hours: If you have questions about a specific lecture, start by contacting the professor who gave the lecture (contact information for all lecturers is below). Drs. Paradiso and Stein are available to answer any questions you have about the course, its administration, the Neuroscience Concentration, and anything else that comes up.

Dr. Paradiso is available Monday 3:30 – 5 or by appointment (email [Michael.Paradiso@brown.edu](mailto:Michael.Paradiso@brown.edu) or call 863-1159). His office is 554 Sidney Frank Hall.

Dr. Stein is available Friday 10am – 12 noon or by appointment (email [John.Stein@brown.edu](mailto:John.Stein@brown.edu) or call 863-2263). His office is 354 Sidney Frank Hall.

### F. Exams and Grades

- All exams will be multiple choice and short answer format and will cover the material presented in lecture and in the assigned reading unless Dr. Paradiso or Dr. Stein state otherwise.
- The course grade is based 25% on each midterm exam score and 50% on the final exam score. The final exam is comprehensive, covering material from the entire semester. It will consist of questions derived 25% from material covered on midterm 1, 25% from material on midterm 2, and 50% on material covered after the second midterm.
- Please note: There are **no make-up exams**. If you are unable to attend an exam for any medical or personal reason a note from Health Services or a Dean of the College is required. If a midterm exam is missed with Dean's approval, the course grade is based 25% on the other midterm and 75% on the final exam. If the final exam is missed with Dean's approval, there is a makeup exam in January.

### V. STAFF

**Course directors:** Professor Michael Paradiso, 554 Sidney Frank Hall, 863-1159  
Professor John Stein, 354 Sidney Frank Hall, 863-2263

**Course secretary:** Heather Shalvey, Department of Neuroscience, 307 Sidney Frank Hall, 863-1054

#### Guest Lecturers:

Dr. Mark Bear, Picower Institute for Learning and Memory, MIT, 617-324-7003, [mbear@mit.edu](mailto:mbear@mit.edu)  
Dr. Wayne Bowen, 389 Biomed Center, x3-3253, [Wayne\\_Bowen@brown.edu](mailto:Wayne_Bowen@brown.edu)  
Dr. Barry Connors, 474 Sidney Frank Hall, x.3-2982, [Barry\\_Connors@brown.edu](mailto:Barry_Connors@brown.edu)  
Dr. Julie Kauer, 487 Biomed Center, x3-9803, [Julie\\_Kauer@brown.edu](mailto:Julie_Kauer@brown.edu)  
Dr. Monica Linden, 366 Sidney Frank Hall, x 3-5192, [Monica\\_Linden@brown.edu](mailto:Monica_Linden@brown.edu)  
Dr. James McIlwain, 470 Sidney Frank Hall, x3-3674, [James\\_McIlwain@brown.edu](mailto:James_McIlwain@brown.edu)  
Dr. Michael Paradiso, 540 Sidney Frank Hall, x.3-1159, [Michael\\_Paradiso@brown.edu](mailto:Michael_Paradiso@brown.edu)  
Dr. James Simmons, 431 Sidney Frank Hall, x. 3-1542, [James\\_Simmons@brown.edu](mailto:James_Simmons@brown.edu)

#### Teaching Assistants:

Graduate Student TA: Matt Pescosolido

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## An Introduction to The Nervous System

Undergraduate TAs:

Eleanor Batty

Sophia Bechek

Alexander Buslov

Deepa Chellappa

Jamie Fried

Yifan “Ronnie” Li

Isaac Lopez

Jill Pandiscio

Jordan Shaw

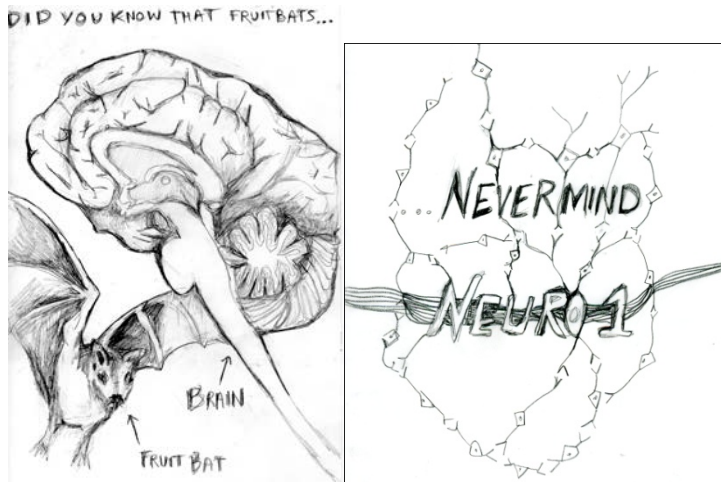
Andrew Silverman

Tina Voelcker

### VI. NEURO 1 T-SHIRTS

We are pleased this year to continue the tradition of creating Neuro 1 T-shirts. All students are encouraged to submit artwork. We, as a class, will select one design for the T-shirts. The cost of the shirts is typically \$8-\$10 each and they will be available by the day of the final.

#### Neuro 1 2011

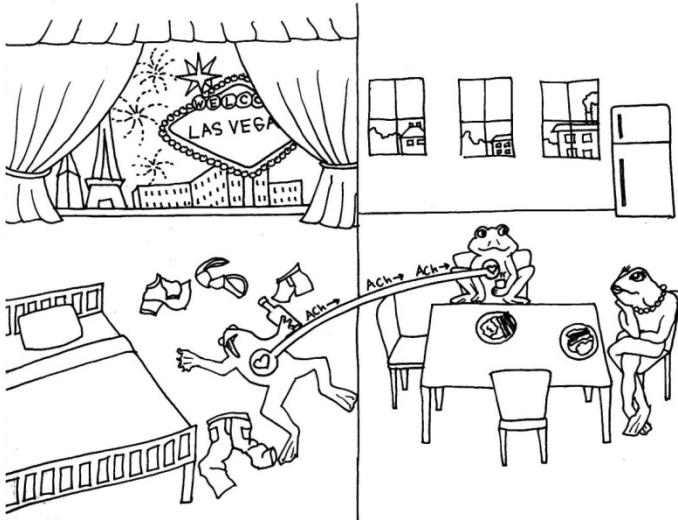


#### Neuro 1 2010



**“What happens in the Vagus Nerve stays in the Vagus Nerve!” (2009)**

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“My brain went on vacation...to Neuroland” (2008)

