BRAIN AND BEHAVIOR (CORE-UA.306) INFORMATION AND SYLLABUS

This CORE course satisfies the Natural Science II requirement.

LECTURE DAYS AND TIMES
11:00-12:15, Mondays and Wednesdays, Room 207 Silver Building.

ATTENDANCE AT LECTURES IS MANDATORY
You are responsible for the material covered in the lectures, a good proportion of which is not in the textbook.

LAB SECTIONS AND TAs (participation in laboratories is mandatory)
Room 201 Silver Building
Thursday 11:00 - 12:40, Edith Lesburgueres
Thursday 1:00 - 2:40, Edith Lesburgueres
Thursday 3:00 - 4:40, Max Ivannikov
Thursday 5:00 - 6:40, Max Ivannikov
Friday 9:00 - 10:40, Michael Rabadi
Friday 11:00 - 12:40, Michael Rabadi

The labs are designed to give you hands-on experience that is relevant to the class material. This should facilitate understanding the lecture material and provide deeper understanding of the lecture material and concepts, which can seem abstract. The labs also give you an opportunity to experience how science works, that it is a creative interpretative process that requires meticulous attention to detail as well as integrating information and observations into concepts. You will write up each lab, which documents the lab experience, record notes, and expresses ideas. Some labs will use animal tissue or living animals. Lab reports must be handed in to your TA before the start of lecture on Wednesday.

LABS PRIOR TO EXAMS HAVE BEEN DESIGNATED AS REVIEW SESSIONS. These times have been allocated to provide you with an extra opportunity to review material and clarify understanding of the course material.

REQUIRED TEXTS
The Mind’s Machine – Foundation of Brain and Behavior
The textbook has online resources you should examine: http://www.mindsmachine.com
For access, you will need to enter the instructor’s email address: afenton@nyu.edu

CORE B&B Lab manual (available at the bookstore)

CLASS WORK AND HOME WORK
You will be assigned readings, podcasts or movies on topics of interest from the media and there will be short quizzes on the assignments in lecture.
EXAMS
There will be three exams (2 midterm exams and a cumulative final exam). The questions will be based on material from the lectures and assigned readings. Questions will be multiple choice, fill-in the blank, short answer, simple drawing, and short essay types.

NOTE THE EXAM DATES ON THE SYLLABUS. THERE ARE NO MAKEUP EXAMS. If you miss a midterm exam, the grade on the final will count proportionately more.

GRADING
Grades will be determined according to the following breakdown:
20% Midterm Exam 1
20% Midterm Exam 2
30% Final Exam
25% Labs
  5% Classwork and Homework

CONTACT INFORMATION

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SYLLABUS

Week 1
2-Sep   Lecture 1. Introduction: Brain and behavior an intimate couple (integrating across levels and scales of complexity)
Reading: Chapter 1

Week 2
7-Sep   Labor Day – No classes

9-Sep   Lecture 2. Brain Organization 1: Structure and function - another intimate couple
Reading: Chapter 2

10/11-Sep Lab 1. The Scientific Method

Week 3
14-Sep  Lecture 3. Brain organization 2: billions of cool cells
Reading: Reading assignment

16-Sep  Lecture 4. Bioelectricity: Electric meat (fat, water and salt)
Reading: Chapter 3 p. 48-54

17/18-Sep Lab 2. Sheep Brain Dissection

Week 4
21-Sep   Lecture 5. Neural communication I: The exciting electrical language of neurons
Reading: Chapter 3 p. 54-64

Reading: Chapter 3 p. 64-73

24/25-Sep Lab 3. A model dendrite

Week 5
28-Sep   Lecture 7. Neural communication 4: Exchanging drugs - there's a lot chemistry between two neurons
Reading: Chapter 4 p. 91-124

30-Sep   Lecture 8. Neural communication 5: Hormones - action at a distance
Reading: Chapter 8 p.202-222.

1/2-Oct   Lab 4. Build your own brain

Week 6
5-Oct   Lecture 9. Hormones: Sex
Reading: Chapter 8 p.223-247.

7-Oct  **Lecture 10.** Stepping back: Evolution/Animals are models too
Reading: Reading Assignment,
Viewing: [https://www.youtube.com/watch?v=fgQLyqWaCbA](https://www.youtube.com/watch?v=fgQLyqWaCbA)

8/9-Oct  **Lab 5.** Microscopy

**Week 7**
12-Oct  **Columbus Day - No classes**

14-Oct  **Lecture 11.** Neurodevelopment or how to build something really complicated
Reading: Chapter 13 p.380-390

15/16-Oct  **Lab:** Review

**Week 8**
19-Oct  **Midterm Exam 1**

21-Oct  **Lecture 12.** Sensation and touching in your head
Reading: Chapter 5 p.108-121

22/23-Oct  **Lab 6.** Somatic sensation

**Week 9**
26-Oct  **Lecture 13.** Moving, how complicated could it be?
Reading: Chapter 5 p.122-139

28-Oct  **Lecture 14.** Ear hairs – Hearing and balance
Reading: Chapter 6 p. 140-159

29/30-Oct  **Lab 7.** Response time

**Week 10**
2-Nov  **Lecture 15.** Seeing and perceiving: how brains see 1
Reading: Chapter 7 p.168-189

4-Nov  **Lecture 16.** Seeing and perceiving: how brains see 2
Reading: Chapter 7 p.189-201

Take-home practice exam (due 9-Nov)

5/6-Nov  **Lab 8.** Vision

**Week 11**
9-Nov  **Review practice exam**
11-Nov  Midterm Exam 2

12/13-Nov Lab: Review Exam

**Week 12**
16-Nov  **Lecture 17.** Neural representation and computation  
Reading: Reading assignment

18-Nov  **Lecture 18.** Attention, cognitive control, and consciousness  
Reading: Chapter 14 p. 394 -421

19/20-Nov **Lab 9.** Action potentials in cockroach

**Week 13**
23-Nov  **Lecture 19.** Memory 1: Amnesia, memory and the learning process  
Reading: Chapter 13 p. 354-369

**25-Nov**  Thanksgiving Break – no classes

26/27-Nov Thanksgiving Break - No lab this week

**Week 14**
30-Nov  **Lecture 20.** Memory 2: Synaptic and molecular plasticity  
Reading: Chapter 13 p. 370-379

2-Dec  **Lecture 21.** Memory 3: Persistent storage  
Reading: Reading assignment: Primary literature and NYT piece on PKMzeta

3/4-Dec **Lab 10.** C. elegans behavior

**Week 15**
7-Dec  **Lecture 22.** Emotion and stress  
Reading: Chapter 11

9-Dec  **Lecture 23.** Neurogenesis: what good are new neurons?  
Reading: Chapter 13 (partly reread) p. 383-392

10/11-Dec **Lab.** Review/Evaluations

**Week 16**
14-Dec  **Lecture 24.** Mental Illness and brain dysfunction  
Reading: Chapter 12, Reading assignment

**Final Exam**  DATE, TIME AND PLACE TO BE DETERMINED