

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

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|------------------------|--------------------|
| 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

Watson and Breedlove. Sinauer, 2012, First Edition

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

Professor

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Teaching Assistants

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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

23-Sep **Lecture 6.** Neural communication 2: Synapses – connections, networks and influence

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>

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