

**School:** Baruch Ivcher School of Psychology

## Biological Basis of Behavior A

**Lecturer:**

Dr. Limor Shtoots slimor@idc.ac.il

**Tutors:**

Mr. Josh Levine josh.levine@post.idc.ac.il

**Teaching Assistant:**

Mr. Josh Levine josh.levine@post.idc.ac.il

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| Course No.: | Course Type : | Weekly Hours : | Credit: |
|-------------|---------------|----------------|---------|
| 8935        | Lecture       | 2              | 4       |

| Course Requirements : | Group Code : | Language: |
|-----------------------|--------------|-----------|
| Exam                  | 201893520    | English   |

**Prerequisites**

**Students who took one of the courses listed below will not be allowed to register to the course Biological Basis of Behavior A (8935):**

8891 - Biological Basis of Behavior A

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## Course Description

This course provides a vital introduction to the connection between brain and mind. In the first semester, we will learn about the life of the cell, and the structure (anatomy) and function (physiology) of the neuron. We will then survey the architecture of the brain and nervous system, and learn about the neurotransmitter and hormone chemicals required for its operation (as well as those that alter it...). Along the way, we will learn about the techniques used to study the brain, such as event related potentials and functional magnetic resonance imaging.

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## Course Goals

The goals of the course are

1. To introduce students to the principles of cellular neurophysiology, systems neuroanatomy, and neurobiological signalling.
2. To acquaint students with key methods of cognitive, affective, and behavioral neuroscience research such as electroencephalography and magnetic resonance imaging.

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## Grading

**Grade components for the semester: 3 short in-class quizzes (6.66% each = 20%), semester exam (80%).**

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## Learning Outcomes

Students should be able to:

1. Explain the principles of cellular neurophysiology, systems neuroanatomy, and neurobiological signalling.
  2. Demonstrate an understanding of electroencephalography and magnetic resonance imaging.
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## Lecturer Office Hours

By appointment through e-mail: slimor@idc.ac.il.

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## Tutor Office Hours

By appointment through e-mail: jn.levine85@gmail.com

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## Teaching Assistant

By appointment through e-mail: jn.levine85@gmail.com

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## Additional Notes

The required textbook chapters (noted below) will be supplemented by articles and other materials assigned by the instructor, which will be available on the course website. It is the responsibility of the student to check that website weekly (at least) for updates, changes and assignments.

**Course requirements: Attendance of lectures (will be enforced in accordance with IDC policy), reading all assigned material, writing quizzes, assignments, and exams.**

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## Reading List

Textbook: Laura A. Freberg, *Discovering Behavioral Neuroscience*, 3<sup>rd</sup> ed.

[+ = additional reading material posted on website]

| Date        | Week | Recitation (Sunday 15:45-17:15)           | Lecture (Wednesday 09:45-11:15)                                  | Reading  |
|-------------|------|---|--|--|
| 3, 6<br>Nov | 1    | The Cell                                  | Thinking Biologically about the Mind; Neurons & Glia - Structure | - Freberg pp. 2-3; 64-76.<br>- Alberts et al., <i>Essential Cell Biology</i> Ch. 1 (pp. 1-6, 11-23). |
| 10, 13 Nov  | 2    | Review (Neurons & Glia – Structure)       | Resting & Action Potentials                                      | Freberg pp.76-87   |
| 17, 20 Nov  | 3    | Review (Resting & Action Potentials)      | Synapses   | Freberg pp. 88-99  |
| 24, 27 Nov  | 4    | General Review                            | <b>QUIZ 1;</b><br>EEG  | - Freberg pp.12-15; 86.<br>- EEG handout.  |
| 1, 4<br>Dec | 5    | Orientation, CSF, Meninges, Vascular, BBB | CNS-PNS, Spinal Cord, Cranial Nerves, Brainstem                  | Freberg pp. 25-39; 51-57   |

|                  |    |  |  |   |
|------------------|----|--|--|---|
| 8, 11 Dec        | 6  | Thalamus, Hypothalamus, Basal Ganglia, Amygdala, Hippocampus             | Cerebral Cortex                                    | Freberg pp. 39-51   |
| 15, 18 Dec       | 7  | General Review   | <b>QUIZ 2</b> ; Neuroimaging (MRI, fMRI, PET, CT)  | - Freberg pp. 9-11.<br>- Ward, <i>Student's Guide to Cognitive Neuroscience</i> , ch. 4   |
| 22, 25 Dec       | 8  | Review (Neuroimaging)  | Glutamate & GABA                                   | Freberg pp. 101-104; 110-112  |
| 29 Dec,<br>1 Jan | 9  | -----<br>(No recitation)   | ACh, Monoamines                                    | Freberg pp. 105-110   |
| 5, 8 Jan         | 10 | Neuropeptides, Gases; Review   | Drug Action, Pharmacokinetics & Pharmacodynamics   | Freberg pp. 113-126   |
| 12, 15 Jan       | 11 | Psychoactive Drugs; Review   | Hormones and Autonomic Nervous System              | - Freberg pp. 128-133; 135-137.<br>- Bear, Connors, & Paradiso, pp. 482-490 (see below*). |
| 19, 22 Jan       | 12 | General Review   | <b>QUIZ 3</b> ;<br>Coffee, Cigarettes, and Alcohol | Freberg pp. 126-128; 133-134  |
| 26, 29 Jan       | 13 | General Review; <b>Make Up Quizzes</b> (only for students with approval) | Laterality   | Freberg pp. 443-456   |

Bear, Mark F., Connors, Barry W., & Paradiso, Michael A. (2007). *Neuroscience: Exploring the brain*. 3<sup>rd</sup> ed. Baltimore, MD: Lippincott Williams & Wilkins.