

## *The Hebrew University of Jerusalem*

### *Syllabus*

## **INTRODUCTION TO BRAIN SCIENCES - 76997**

*Last update 27-02-2025*

*HU Credits:* 3

*Degree/Cycle:* 1st degree (Bachelor)

*Responsible Department:* Unit in Brain Sciences with a Computational

*Academic year:* 0

*Semester:* 2nd Semester

*Teaching Languages:* Hebrew

*Campus:* E. Safra

*Course/Module Coordinator:* David Omer

*Coordinator Email:* [david.omer@elsc.huji.ac.il](mailto:david.omer@elsc.huji.ac.il)

*Coordinator Office Hours:* Sunday, 14:00

*Teaching Staff:*

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Dr. David Omer,  
Mr. Reuven Lifshitz

Course/Module description:

*How can a chunk of 1.5 kg of flesh be responsible for our perception, dictate our actions and be the seat of our emotions and cognition? During the course we will explore the structure and function of the brain from the cellular, circuit and area level. We will learn how neurons can master electrical biophysical signals to process information and, together with glia cells, generate behavior. The learning process is highly interactive as it includes class discussions on current literature and various "hands-on" experiences such as dissecting bovine brains at class.*

Course/Module aims:

Learning outcomes - On successful completion of this module, students should be able to:

*At the end of the course the students will understand basic principles of the nervous system's activity, learn the basic processes which allow neuronal circuits in the brain to compute.*

Attendance requirements(%):

100

Teaching arrangement and method of instruction:

Course/Module Content:

- 1) Genes cells and synapses
- 2) neurons - the cellular doctrine
- 3) passive electrical properties of neurons
- 4) synaptic transmission
- 6) Active electrical properties of neurons
- 7) neural plasticity
- 8) Neural code
- 8) The hippocampal system as an example system in systems neuroscience
- 10) Neuroanatomy of the mammalian brain

Required Reading:

*Principles of neural science. (McGraw-Hill, 5th edition).*

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*The course does NOT follow the book.*

*Additional Reading Material:*

*Grading Scheme:*

*Submission assignments during the semester: Exercises / Essays / Audits / Reports  
/ Forum / Simulation / others 80 %*

*Attendance / Participation in Field Excursion 20 %*

*Additional information:*