האוניברסיטה העברית בירושלים THE HEBREW UNIVERSITY OF JERUSALEM



## The Hebrew University of Jerusalem

Syllabus

### Structure & Function of Biomolecules - 94650

Last update 02-05-2024

HU Credits: 3.5

Degree/Cycle: 1st degree (Bachelor)

**Responsible Department:** Bio-Medical Sciences

Academic year: 0

Semester: 2nd Semester

<u>Teaching Languages:</u> Hebrew

Campus: Ein Karem

Course/Module Coordinator: Prof Reuven Wiener

Coordinator Email: ReuvenW@ekmd.huji.ac.il

Coordinator Office Hours: By Appointment

Teaching Staff:

Prof Reuven Wiener, Dr. Yoav Saul, Ms. Reut Bruck, Ms. Klil Cohen

#### Course/Module description:

The course teaches the basic principles of structure and activity as well as the organization of molecules to form the living cell. The course will focus on the properties of proteins, fatty acids, and sugars and how they are organized to form cell organelles. The course will teach about enzymes and their importance and functions.

#### Course/Module aims:

To get familiar with the different Biomolecules and to understand the molecular basis of their function and cellular regulation

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

Understanding basic biological concepts, enzymatic reactions, inhibition of enzyme activity, the kinetics and biochemical mechanism of enzyme inhibitors and their importance for drug development.

#### <u>Attendance requirements(%):</u>

mandatory attendance in tutorials and submitting exercises

Teaching arrangement and method of instruction: Lectures and Exercises

<u>Course/Module Content:</u> Prof. Reuven Weiner: The protein family 1. Amino acids. 2. Peptides

3. Spatial organization of proteins

4. Determining the structure of proteins

5. Tertiary and quaternary structure of proteins 6. Oxygen carriers myoglobin and hemoglobin

Dr. Yoav Shaul Lecture topics: Sugars carbohydrates and glycans Lesson 1-2: Monosaccharides and disaccharides Lesson 3-4: Polysaccharides Lesson 5-6: Glycoproteins Lesson 7: sugar and lipids Lesson 1-2: Storage. Lesson 3-4: Structure Lesson 5-6: Information and control Lesson 7: methods

Prof. Reuven Wiener

Enzymes - function and modes of action. Michaelis Manten equation Vmax, Km, inhibition of enzymatic activity Allostery, positive and negative modulation of enzyme activity. Enzymatic catalysis with covalent binding to the substrate - chymotrypsin

<u>Required Reading:</u>

Lehninger; Principles of Biochemistry Sixth Edition 2013 Chapters: 3, 4, 5, 7,8, 9, 10, 11, 12

<u>Additional Reading Material:</u> Appears in Med. School Edu Portal

<u>Grading Scheme:</u> Written / Oral / Practical Exam 85 % Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 15 %

Additional information: