



# *The Hebrew University of Jerusalem*

## *Syllabus*

### *BIOCHEMISTRY - 73955*

*Last update 29-09-2024*

*HU Credits: 2*

*Degree/Cycle: 2nd degree (Master)*

*Responsible Department: Nutritional Sciences - International Prog.*

*Academic year: 0*

*Semester: 1st Semester*

*Teaching Languages: English*

*Campus: Rehovot*

*Course/Module Coordinator: Prof Oren Froy*

*Coordinator Email: [oren.froy@mail.huji.ac.il](mailto:oren.froy@mail.huji.ac.il)*

*Coordinator Office Hours: by appointment*

*Teaching Staff:*

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Prof. Oren Froy

Course/Module description:

*Protein structure and function, Enzymes - basic concepts and kinetics, Regulatory Strategies, Carbohydrates, Lipids and Cell Membranes, Vitamins and Metabolism*

Course/Module aims:

*Understanding biochemical principles of proteins, enzymes and metabolic pathways.*

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

*Describe protein structure  
Describe carbohydrate groups  
Compare between various metabolic pathways*

Attendance requirements(%):

*None*

*Teaching arrangement and method of instruction: Lectures*

Course/Module Content:

*Protein Structure and Function: amino acids; primary, secondary, tertiary, and quaternary structure of proteins; purification and analytical methods of proteins.*

*Enzymes - basic concepts and kinetics - enzymes as powerful and highly specific catalysts; Michaelis-Menten model; enzyme inhibition.*

*Regulatory Strategies: myoglobin; hemoglobin cooperativity in binding oxygen.*

*Carbohydrates: monosaccharides; disaccharides; polysaccharides.*

*Lipids and Cell Membranes: fatty acids; membrane lipids; phospholipids; glycolipids; integral and peripheral proteins; membrane transport; membrane channels and Pumps; active and passive transport.*

*Metabolism: glycolysis and gluconeogenesis; the citric acid cycle; oxidative phosphorylation; the calvin cycle and the pentose phosphate pathway; glycogen metabolism; fatty acid metabolism; protein turnover and amino acid catabolism;*

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*urea cycle; biosynthesis of amino acids; integration of metabolism.*

*Required Reading:*

*In course presentations*

*Additional Reading Material:*

*In course presentations*

*Grading Scheme:*

*Written / Oral / Practical Exam 100 %*

*Additional information:*

*The course is given to international non-thesis MSc students*