



The Goodman
Faculty of Life Sciences
Bar-Ilan University

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Biochemistry I 80201

Prof. Yaron Shav-Tal, Prof. Cyrille Cohen, Prof. Jeremy Don, Dr. Yoav Paas

Yaron.Shav-Tal@biu.ac.il, Cyrille.Cohen@biu.ac.il, donjerem@gmail.com,
yoav.paas@biu.ac.il

Academic year: 2021-2022 Semester: A Hours/credits: 5h/ 2.5 credits

Mandatory / elective (mark the relevant)

Prerequisites: None

Year in program & how often given, if relevant – 2nd year BSc

Course Overview – Short abstract:

The course will cover the principles of Biochemistry focusing of the biochemical basis of information transfer in the cell (nucleic acid structures, weak interactions, replication, transcription , translation)

Learning outcomes – short descriptions (don't have to write if you don't have LO)

The student will understand the basic principles of genomic information transfer in prokaryotic and eukaryotic cells with focus on the mechanisms and key molecules participating in the processes of replication, DNA damage repair, transcription and translation

Assessment: Coursework and Grade structure

90% exam, 10% coursework

Week-by-Week content, assignments and reading

Lesson #	Subject	
1	Introduction, thermodynamics	

2	Nucleic acids, DNA structure	
3	Replication	
4	Replication	
5	Replication	
6	DNA damage repair	
7	DNA damage repair	
8	Transcription	
9	Transcription	
10	Transcription	
11	Transcription	
12	Translation	
13	Translation	
14	RNA degradation, NMD, RNAi	
15	Protein Primary Structure	
16	Secondary Structure: Molecular Helices and Pleated Sheets	
17	Fibrous Proteins: Keratins, Fibroin, Collagen, Elastin and Globular Proteins: Tertiary Structure and Functional Diversity	
18	The Thermodynamics of Folding and Interactions and Protein folding – examples and Chaperonins, Prions	
19	Mechanism of Oxygen Binding by Heme Proteins , Cooperativity	
20	BPG and Mutations, sickle cell and thalassemias	
21	Catalysts	
22	Induced Fit Model, examples: Triose Phosphate Isomerase and Serine Protease	
23	Michaelis-Menten Kinetics and the Significance of K_M , k_{CAT} , and k_{CAT}/K_M	
24	Enzyme Inhibition: Reversible: Competitive and Noncompetitive Inhibition	
25	Multisubstrate Reactions, Random, ordered and ping-pong substrate Binding , Coenzymes and Classification of Protein Enzymes	
26	Allosteric Enzymes: Homoallostery/Heteroallostery	

Required text:

Textbook: Biochemistry: Mathews, Van Holde, Appling, Anthony-Cahill, 4th edition