SYLLABUS

BIOLOGICAL CHEMISTRY - Fall 2019

BIOLOGY 300/301

Time: MW 5:35-6:50 PM
Location: 714 West

LECTURER:

David A. Foster, Professor
Office: 432 Belfer Research Building
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Office hr: Tue 2-3:30

RECOMMENDED TEXT:

Lehninger Principles of Biochemistry, 7th Ed
Nelson and Cox; WH Freeman

Other standard Biochemistry texts will suffice as will the 5th or 6th Ed of recommended text

COURSE DESCRIPTION:

BIOL 300.00 is 5.5 hrs (two 1 hr and 15 min lectures/week; one 3 hr lab), 4.5 Cr.

Prerequisite: Biol 203 (For Biology Majors); Co-Requisite: Chem 222

Basic principles of biological chemistry; physical properties of biological molecules, protein structure and function, mechanism of enzyme catalysis, membranes and lipids, carbohydrates. Metabolism is emphasized from bioenergetics, the principles involved in glycolysis, the Krebs cycle, and cellular respiration in the mitochondria. Nucleic acids are covered in the context of storing genetic information, transcription, and protein synthesis. Experiments in the laboratory cover a variety of techniques to analyze proteins, membranes, gene expression that involve the principles of Biochemistry. The emphasis and objective of this course is for students to develop an understanding and *appreciation* of the logic and principles that are inherent in Biological Chemistry that will form a foundation for more advanced endeavors in research and medicine. This course is intended for Biology majors and pre-medical students.

BIOL 301.00 is BIOL 300.00 without the lab and consists two 1 hr and 15 min lectures/week), 3.0 Cr.

Prerequisites: BIOL 100; Co-requisite: Organic Chemistry

BIOL 301.00 is recommended for post-bacs who need a one semester course, but do not need a lab. This course is suitable for the biochemistry requirements of most medical schools.

Learning outcomes: If students learn the material, they will gain an understanding of the core principles of biochemistry that make up the foundation for the life sciences and medicine.

COURSE CONTENT AND CALENDAR:

Lecture			Topic:	Reading:
Aug	28	W	Introduction, amino acids, pH, pK, pI	Ch 2; Ch3, 75-102
Sept	4	W	Physical properties of peptides I	Ch 2; Ch 3, 75-102
	5	Th	Physical properties of peptides II	Ch 2; Ch 3, 75-102; Ch 5, 172-3
	9	M	Thermodynamics and protein folding	Ch 1.3; Ch 4, 115-25, 142-51
	11	W	Higher order structure, hemoglobin	Ch 5.1
	16	M	Allostery and the Hill coefficient	Ch 5.1
	18	W	Enzyme kinetics I - K_m & K_d	Ch 6, 187-213
	23	M	Enzyme kinetics II – inhibition	Ch 6, 187-213
	25	W	Enzyme catalysis – serine proteases	Ch 6, 213-7
Oct	2	W	Regulation of protein function I	Ch 6, 225-36;
	7	M	Regulation of protein function II	Ch 12, 461-66; 481-87
	16	W	Lipids and membranes	Ch 10; 11, 387-405
	21	M	Phospholipid metabolism	Ch 10.2
	23	W	Lipoproteins and cholesterol	Ch 21, 837-54
	28	M	**Exam I**	
	30	W	Carbohydrates	Ch 7, 241-61
Nov	4	M	Glycolysis	Ch 14
	6	W	TCA Cycle	Ch 16
	11	M	Fatty acid synthesis and oxidation	Ch 17; Ch 21, 811-837
	13	W	Mitochondrial ATP production	Ch 19, 711-44
	18	M	Metabolism and cancer	Ch 14, 545-548
	20	W	Nitrogen metabolism	Ch 18, 675-90
	25	M	Nucleic acid structure	Ch 8
	27	W	Chromosomes & DNA metabolism	Ch 24; 25, 987-1016
Dec	2	M	Gene expression	Ch 26.1
	4	W	Translation I	Ch 27.1
	9	M	Translation II	Ch 27.2
	11	W	**Exam II**	

Method of evaluation: Two exams will given based entirely on material discussed in lectures (300 points). The lab component will consist of quizzes and lab reports (160 points).

Academic integrity: Students who plagiarize laboratory reports or cheat on exams will be reported immediately to the Dean of Students office, and be subject to discipline or expulsion.

AccessABILITY: "In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, call: (212) 772- 4857 or (212) 650-3230."