

السنة الأولى – الفصل الصيفي
مقدمة في الكيمياء الحيوية

Introduction to Biochemistry (2 credit Hours)

Medical students

1st year / Summer course

(0501112)

This course aims at introducing first year medical students to the basic chemical & biological foundations of biochemistry before studying metabolism & disorders in the second year. Topics in this introduction include water, acids, bases, pH & buffers. Structure and properties of the major biomolecules such as carbohydrates, lipids & proteins; Characterization, purification & determination of protein structure; Structure-function relationship of selected protein; Enzymes kinetics, mechanism of action & control; Clinical application of enzymes & isoenzymes.

Topics	No. of Lec.
Lectures & small group discussions	
Relationship of organic chemistry to biochemistry	1
Water structure, properties, polarity, & ionization	2
Acid bases & buffers	3
Carbohydrates: classification, structure, properties	4,5,6
Lipids: major classes, structure & functions	7,8,9
Amino acids: structure classification ionic properties of amino acids	9,10
Peptides	11
Protein: structure purification & characterization	12,13,14
Structure function	15,16,17
Enzymes: general properties classification & nomenclature of enzymes kinetics, inhibition, regulation, mechanisms, clinical enzymology	18,19,20 21,22,23
Relationship between cell biology & biochemistry	23,24
Cell signaling & chemical messengers	25,26,27

1. Water, acids, bases & buffers
covalent & non-covalent interactions in biomolecules.
2. the major classes of biomolecules:
 - I Carbohydrates & complex carbohydrate.
 - II Lipids & membrane structure
 - III Amino – acids in proteins.
3. Protein structure & function
 - I Structure of proteins, globular proteins, fibrous proteins, physical properties of protein.
 - II Enzymatic reactions**
Thermodynamics, enzyme kinetics, reactions types & mechanism, clinical enzymology.
 - III Oxygen transporters:**
Hemoglobin & myoglobin