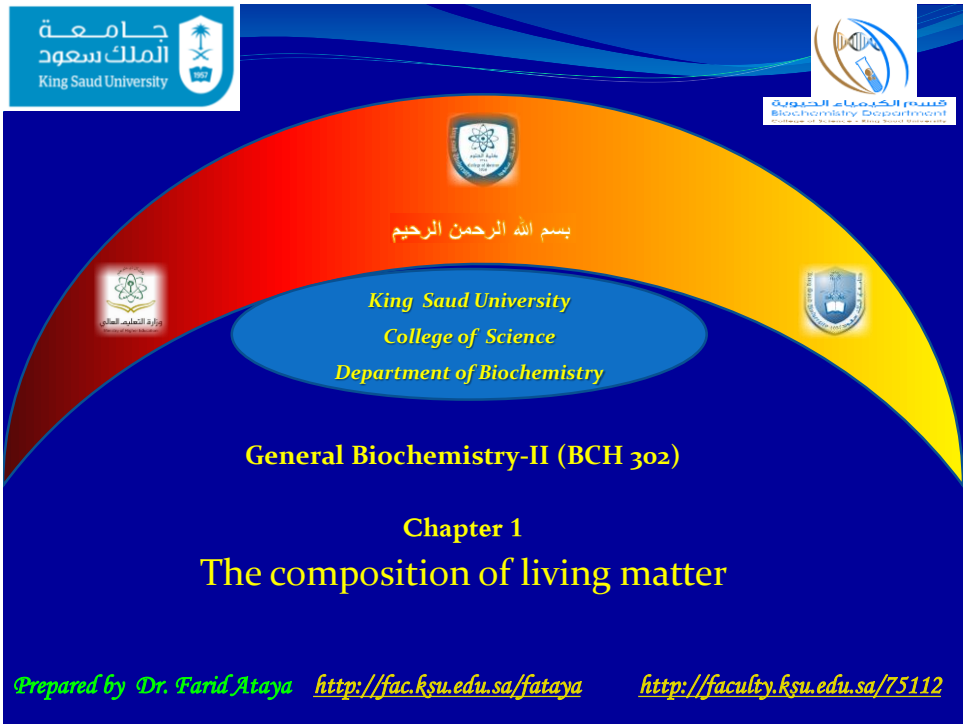


BCH 302
General Biochemistry-2

- Course Symbol & No. : BCH 302
- Credit Hours : 4 (3+1)
- Prerequisite : BCH 201
- Class schedule : Sunday, Tuesday, Thursday
  9:00 am to 9:50 am.
- Class location : AA35 building No. 5
- Examinations : Continuous Assessment Tests (CAT)
  - Weekly quiz (every Thu 2 marks x 10 weeks)
  - First (10 Marks) Sun, 00/00/1438h – 00/00/2017
  - Second (10 Marks) Tues, 00/00/1438h – 00/00/2017
  - Practical (20 Marks)
  - Final (40 Marks)

Course Objectives

- **To familiarize students with the basic biochemical knowledge necessary to meet the institutional objectives and goals for general biochemistry, like:**
  i. building blocks of cellular components
  ii. monosaccharides, oligosaccharides and polysaccharides,
  iii. lipids, enzymes, co-enzymes, vitamins,
  iv. nucleic acids and
  v. Introduction to general metabolic pathways of different macromolecules

Topic	No of Weeks	Lectures
The composition of living matter. Biomolecules. The elements of biomolecules (shape, dimensions and functional groups). Building blocks of biomolecules (amino acids , nitrogenous bases , simple sugars and fatty acid)	1	2-4
• **Carbohydrates:** • Function and classification: - Monosaccharides structure, epimers, optical activity, solubility, cyclic structure, anomers, reducing sugars, monosaccharide derivatives. - Functions of glucose , fructose and galactose - Reactions of simple sugars	1.33	5-8
• Glycosidic bonds (Types and structure) - oligosaccharides: structure of disaccharides (e.g. maltose, lactose, sucrose), - structure of trisaccharides - polysaccharides: classification, structure and Function. Storage polysaccharides: starch. glycogen Structural Polysaccharides:, cellulose, chitin,	1.33	9-12
• Functional polysaccharides: glycosaminoglycans and heparin. Glycoproteins and there functions : adhesion immunology, recognition Introduction to sugar metabolism	1.33	13-15

Topic	No of Weeks	Lectures
• **Lipids:** • Definition, function, fatty acids, classification: -simple lipids: structure and function (TAG, waxes) -compound lipids: structure and function (phospholipids, sphingolipids) -derived lipids: structure and function (cholesterol, bile acids) Lipoproteins, micelle, membrane structure.	1.33	16-19
• Glycerophospholipids (classifications, types& function) Sphingolipids (classifications, types& function) Triglycerides Steroids (structure,properties,&functions;cholesterol, terpenes, vitamins& steroid hormones)	1.33	20-23
• Lipoproteins	0.66	24-25
• Introduction to biomembranes and adipocytes Assembly of lipid molecules (membrane and adipose tissue) Fluid mosaic model and types of membrane proteins Fat storage & mobilization in adipose tissue	1	26-28
• Introduction to lipid metabolism	0.33	29

Topic	No of Weeks	Lectures
• **Nucleic acids:** **Structure of a nucleotide,** - types of nitrogen bases, - structure of nucleosides - nomenclature of nucleosides and nucleotides, - phosphodiester bonds, - properties of nitrogen bases, - Roles of functional nucleotides	0.66	30-31
- **Nucleotides derivatives (NAD, NADP, FAD, FMN, c AMP, c GMP)**	0.66	32-33
• **Over view of DNA and RNA.** - DNA primary structure: Description and orientation of bonds. - RNA: Types, role and structure. - Secondary structure of DNA (double helix) - Double helix properties, base pairing, reading, stabilizing forces. - DNA denaturation : significance and factors - Tertiary structure of DNA (relaxed, coiled and associated proteins; histones, protamines). **Genetic code, exon and introns: Gene, genome and chromosome** **Introduction to replication, transcription and translation and important enzymes**	1.66	34-38
Introduction to: Vitamins, Co-enzymes, Heme and minerals Hormones	1.33	39-42

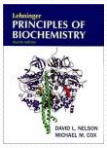
Books

- **Biochemistry.**

by D. Voet and J. Voet (latest edition)

- **Lehninger: Principles of Biochemistry**

by DL. Nelson and MI. Cox (latest edition)



- **Biochemistry** by Stryer (latest edition)

The Practical part of BCH 302

Topic	No of Weeks	(hour)
Safety in the laboratory	1	2
Tutorial on writing experiment reports and introduction to the most commonly used instruments in biochemistry	1	2
Buffer: titration of a weak acid, pH, pKa and buffer capacity	1	2
Amino acids: Detection and estimation	1	2
Proteins: Detection and estimation	1	2
Determination of total of carbohydrates	1	2
Hydrolysis of amylose and quantitative estimation of glucose	1	2
General characterization and qualitative tests for lipids	1	2
Determination of the iodine number of fat	1	2
DNA characterization, absorption spectrum, 260/280 ratio, reaction with diphenylamine (Quantitative), and measuring DNA melting	2	4
RNA characterization, absorption spectrum, 260/280 ratio, reaction with Orcinol (Quantitative)	2	4

كيح ٣٠٢

رمز المقرر: ٣٠٢ كيح
أسم المقرر: كيمياء حيوية عامة-٢
ساعات المقرر: ٤ (٣+١)
متطلب سابق: كيح ٢٠١

الوصف:
هذا هو الشق الثاني من مقرر تعريفي عام للكيمياء حيوية. ويشمل هذا الشق تغطية السكريات، والدهون، والأحماض النووية، وبنيات كيميائية ذات مهمة (الهرمونات، الفيتامينات، الخ)، مع التأكيد على بنية ووظائف هذه الجزيئات الكبيرة

Course Symbol: BCH 302
Course Title: General Biochemistry-II
Credit hours: 4 (3+1)
Prerequisite: BCH 211

Description:
This is the second part of a general introductory biochemistry course. This part covers carbohydrates, lipids, nucleic acids, and relevant chemical moieties (hormones, vitamins, etc.), with special emphasis on macromolecules structures and functions.

Text Books:

1. 1: Voet & Voet: Biochemistry, Wiley & Sons Inc. New York
2. Nelson, DL; Cox, ML. Lehninger : Principles of Biochemistry. Worth Publishers; New York
3. Stryer, L: Biochemistry. W.H. Freeman and Company, New York