



Course Syllabus

2nd Semester 1439/1440

Course Number	Course name	credit hours	Communication hours
BIOC 074	BIOCHEMISTRY	4	6
Prepared by:	Dr. Basiony Fouad Dr. Waleed Eltantawy		
Mobile			
e-mail:	Dr.basiony_fouad@yahoo.com		

Course's Objectives:

Upon completion of this course the student should be able to:

- 1- Describe the structure and functional characteristics of carbohydrates.
- 2- Explain how the metabolism of glucose leads ultimately to the generation of large quantities of ATP.
- 3- Describe the structural and functional characteristics of amino acids. Classification of amino acids based on side chain characteristics and on nutritional requirement.
- 4- Learn the chemistry of proteins and its importance in molecular level, structure and classification.
- 5- Imagine the structure of DNA.
- 6- Analyse the interaction between DNA and protein.
- 7- Describe the structure, functional characteristics and classification of lipids.
- 8- Recognize the vitamins and its important to the human health.
- 9- Recognize the enzymes and coenzymes and their role in the biological processes in the body.
- 10- Evaluate the clinical enzymology
- 11- Demonstrate knowledge of laboratory techniques used for glucose, protein, urea and lipids determination in biological samples.

Text Book:

- Textbook of biochemistry for medical students, 6th edition, DM Vasudevan, ed (jaypee); ISBN: 978-93-5025-016-7.
- Lehninger principles of biochemistry, 5th edition, David L Nelson & Michael Cox (W. H. Freeman and Company); ISBN-13: 978-0-7167-7108, ISBN-I 0: 0-7 167 -7 r08-X.

- Practical Biochemistry 1st edition, Geetha Damodaran, (jaypee); ISBN 978-93-5025-141-6.
- Practical textbook of biochemistry for medical students, 2nd edition, DM Vasudevan, ed (jaypee); ISBN: ISBN 978-93-5090-668-2
- **Grading:**

Parameters	Score
Quiz 1	10%
Mid-term	20%
Quiz 2	10%
Laboratory performance	10%
Tutorials	10%
Final exam	40%
Total	100%

Attendance:

Attendance will be taken in the first 5 minutes of the lecture (lectures). If you came late, you should remind me at the end of the class to consider your attendance for the second lecture, otherwise, you will be marked absent for the two lectures. Accepted excuses for absence should be submitted within two weeks after the absent lectures.

Course schedule (by Weeks):

No of Weeks	Lectures (2hr/week)	Tutorials (2hr/week)	Practicals (2hr/week)
W1 06/01/2019	Chemistry of Carbohydrate: <ul style="list-style-type: none"> ▪ Definition. ▪ Biological importance of Carbohydrate. ▪ General Classification of Carbohydrate. ▪ Mono and disaccharides: Definition - Classification - structural composition with examples and their 	Isomerism	General Laboratory Safety

	Derivatives.		
W2 13/01/2019	<p>Chemistry of Carbohydrate:</p> <ul style="list-style-type: none"> ▪ Oligosaccharide: Definition - glycosidic bond - and include structure, existence and its significance - chemical properties. ▪ Polysaccharides: Definition- classification and their derivatives. ▪ Metabolism of carbohydrates 	Glycosides and their clinical importance	Spectrophotometry
W3 20/01/2019	<p>Amino acids:</p> <ul style="list-style-type: none"> ▪ Definition and composition - Classification of amino acids according to the (acidic and Alkali properties and nutritional function). ▪ Chemical properties of amino acids (reactions due to amino groups, carboxyl group and side-chain). ▪ Peptides: formation of peptides- examples of some of the vital peptides, 	Amino acid	Qualitative tests of Carbohydrate
W4 27/01/2019	<p>Protein :</p> <ul style="list-style-type: none"> ▪ Structural and functional characteristics of protein. Classification of protein. ▪ Structure of Protein: <ul style="list-style-type: none"> - Primary Structure. - Secondary Structure. - Tertiary Structure. - Quaternary Structure. 	Bonds Responsible for Protein Structure.	W4 Quiz 1
W5 03/02/2019	<p>Protein :</p> <ul style="list-style-type: none"> ▪ Structural features of insulin and haemoglobin. 	Digestion and absorption	Estimation of glucose quantity in a biological

	<ul style="list-style-type: none"> Denaturation of protein. 	of proteins	sample
W6 10/02/2019	Chemistry of Lipids: <ul style="list-style-type: none"> Definition, Biological Importance, existence and General Classification of Lipids. Fatty acids: Definition, Classification and Nomenclature of Fatty acids. 	Digestion, absorption and utilization of dietary lipids	Estimation of protein quantity in a biological sample
W7 17/02/2019	Chemistry of Lipids: <ul style="list-style-type: none"> Simple lipids. Triglycerides and its types. Waxes and its important types. Fat constant (Saponification number, acid number and iodine value) Phospholipids, e.g Phosphatidic acid, Lecithin and Cephalin - Lipoprotein: Chylomicrone, VLDL, LDL and HDL. 	Biological and clinical importance of lipids	Estimation of lipid profile in blood
W8 24/02/2019 Mid-term Exam			
W9 03/03/2019	Metabolism of lipids: <ul style="list-style-type: none"> Digestion and absorption of fat Oxidation of fatty acid Beta oxidation Energy resulting from the beta oxidation 	Beta oxidation	Estimation of blood urea
W10 10/03/2019	Nucleic acids: <ul style="list-style-type: none"> Chemistry, classification and characteristics of purine and pyrimidine 	The role of ATP	Estimation of serum creatinine

	<p>bases.</p> <ul style="list-style-type: none"> Chemistry, classification of nucleosides and nucleotides. 		
<p>W11 17/03/2019</p>	<p>Enzymes:</p> <ul style="list-style-type: none"> Definition – nomenclature – structure of enzymes Enzymes classification Coenzyme & Isozymes. Specificity, enzyme substrate complex and active sites. 	Enzymes	Estimation of liver enzyme (GOT, GPT)
<p>W12 24/03/2019</p>	<ul style="list-style-type: none"> Factor affect enzyme activities (PH, temperature, amount of enzyme and substrate). Competitive, noncompetitive inhibition, allosteric inhibition, feedback inhibition and enzyme kinetics 	Clinical importance of enzymes	W12 Quiz 2
<p>W13 31/03/2019</p>	<p>Vitamin:</p> <ul style="list-style-type: none"> Structural and functional characteristics of water soluble vitamins Clinical importance of water soluble vitamins (B complex, C, Folic acid and B12). 	Clinical importance of fat-soluble vitamins (E and K)	DNA Electrophoresis
<p>W14 07/04/2019</p>	<p>Hormones:</p> <ul style="list-style-type: none"> Definition – Classification and Mode of action of hormones. Pituitary gland hormones (Vasopressin and oxytocin) Thyroid gland hormones (Thyroxin) 	Clinical importance of pituitary and thyroid glands	Practical exam
<p>W15 14/04/2019</p>	<p>Hormones:</p> <ul style="list-style-type: none"> Pancreas gland hormones (Glucagon and Insulin). 	DSL	-----

	<ul style="list-style-type: none">Reproductive hormones (Estrogen, Progesterone and testosterone).		
		W16	
		21/04/2019	
		Final Exam	

Dean signature