



Department of: Chemistry

College of: Education

University of: Salahaddin

Subject: Biochemistry

Course Book – (Year 3 Chemistry)

Lecturer's name: Dr. Zeyan Abdullah Ali

Academic Year: 2022/2023

Course Book

1. Course name	Practical biochemistry
2. Lecturer in charge	Dr. Zeyan Abdullah Ali
3. Department/ College	Chemistry/Education
4. Contact	e-mail: zeyan.ali@su.edu.krd Tel: (optional):07500464540
5. Time (in hours) per week	Practical: 4
6. Office hours	10
7. Course code	
8. Teacher's academic profile	<p>Since 1989, I worked as a chemical assistant in chemistry department/ Education college. I obtained MSc in 1994 in the field of natural products in Education College/ Saladaddin University at 1994, and published a number of scientific papers in the field of organic chemistry. I completed Ph.D in the field of clinical biochemistry in Ibn Al- Haitham college/ Baghdad University at 2006 and I published a number of scientific papers in the field of clinical biochemistry. I obtained Assistant Professor in 2010. The fields of my research interests are oxidative stress and prenatal biochemical screening.</p> <p>The objectives that I had taught: Analytical Chemistry, Organic Chemistry, Biochemistry, Natural Product, Phytochemistry/ undergraduate students.</p> <p>Natural Product, Clinical biochemistry, Metabolism and its regulation, Plant biochemistry, and Advanced biochemistry/ M.Sc. students.</p> <p>Currently I'm working in chemistry department and I'm supervisor for two M.Sc students.</p>
9. Keywords	Carbohydrate ,Lipid, Protein, Enzyme, and Vitamin
10. Course overview: <p>Biochemistry can be defined as the science concerned with the chemical basis of life. The cell is the structural unit of living systems. Thus, biochemistry can also be described as the science concerned with studying the various molecules that occur in living cells and organisms and with their chemical reactions.</p> <p>Biochemical reactions are involved in such areas as breaking down food molecules, generate and store energy, buildup new biomolecules, and eliminate waste. Some biomolecules are small and have only a few functional groups others are big and contain a large number of functional groups. The principal classes of biomolecules are carbohydrates, lipids, Proteins, enzymes, and vitamins. This course provides fundamental concepts in clinical biochemistry. Primary topics include identification, the structures, and properties of carbohydrates, lipids, amino acids, proteins and vitamins. The enzyme kinetics, inhibition, and the purification of enzymes are also addressed. Also provides fundamental concepts in clinical biochemistry which include analysis of blood and evaluation the activity of some enzymes which are present in our body and effect on heart, kidney, and liver.</p>	

11. Course objective:

Upon successful completion of this course, the students will be able to:

1. Know the principles, theory and calculations of each experiment.
2. They should know to prepare all the solutions by themselves. They should standardize their solutions individually.
3. Students should know to distinguish and identification of biomolecules like carbohydrates, lipids, and amino acids with proteins.
4. Determination of biomolecules like carbohydrates, lipids, and amino acids with proteins in different samples. Also to know the determination of some vitamins like vitamin C in blood and in some vegetables and fruits like green pepper, oranges, and Limon.
5. Determination of saponification and Acid value of fats and oils.
6. Calculation the concentration of unknown sample by using the calibration curve.
7. To give the students experience in biochemical methodology in order to appreciate the clinical biochemistry techniques as diagnostic tools, and to be able to interpret the results for appropriate diagnosis and follow up of patients.

12. Student's obligation

1. Student is expected to attend all lecture, laboratory classes, reports, seminars and intermediate assessments on time, be prepared for and participate in discussion during seminars and laboratory classes.
2. Students are expected to perform all the practical's mentioned in the syllabus.
3. It is beneficial to read and understand the lecture before the seminars and laboratory classes.
4. Students must be turn off cell phones, talking and speaking, and drinking or eating are not permitted during laboratory class.

13. Forms of teaching

Different forms of teaching will be used to reach the objectives of the course: power point presentations and by using white board for explanation of concepts the principle and the reaction of the experimental.

Every week before the lecture day, I will be given Digital copy of each lecture to students to obtain hard copy and to read the lecture before laboratory classes.

14. Assessment scheme

The students are required to do two examinations at the mid of the semester (75 degree) in addition to the final examination. Also the student must be do the following activity:

Quiz every week (5 degree)

Seminars (10 degree)

Report (10 degree)

15. Student learning outcome:

Upon successful completion of this course, the students will be able to:

1. Know structures, and chemical properties of macromolecules such as carbohydrates, lipids, amino acids, proteins
2. Introduce the students to the techniques of protein purification and protein characterization
3. Provide practical experience in the determination of enzyme kinetic parameters;

4. Provide an introduction to the chemical and biochemical literature and the Library.
5. Provide an introduction to preparing scientific reports and documents.
6. Also Student's independent work
7. Student's preparation for a seminar

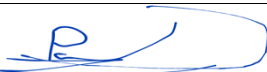
16. Course Reading List and References:

1. Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer, Biochemistry, 5 th edition, W.H. Freeman and Company, New York, 2004.
2. Devlin T.M., Textbook of Biochemistry with clinical correlations, 6 th edition, Wiley-Liss A John Wiley & Sons, Inc., Publication, 2006.
3. Champe P.C., Harvey R.A., and Ferrier D.R., Lippincotts illustrated reviews Biochemistry, 3 rd edition, Lippincott Williams & Wilkins, 2011.
4. Murray R.K., Granner D.K., Mayyes P.A., and Rodwell V.W., Harpers illustrated biochemistry, 26 th edition, The McGraw-Hill Companies, 2003.
5. Shivananda Nayak B., Manipal Manual of clinical biochemistry, 3 rd edition, Jaypee brothers Medical publishers, New Delhi, 2007
6. Shivaraja Shankara, Laboratory manual for practical biochemistry, Jaypee brothers Medical publishers, New Delhi, 2008.

17. The Topics:**Lecturer's name****18. Practical Topics (If there is any)****Second semester**

Week 1: Accuracy and precision
 Week 2: Spectrophotometry and UV/VIS Spectroscopy
 Week 3 : Colorimetric Determination of blood Glucose
 Week 4 : Estimation of total cholesterol in serum
 Week 5 : Determination of Total protein and Albumin-globulin ratio
 Week 6: Determination of urea in blood
 Week 7: Determination of calcium in serum
 Week 8 : Determination of uric acid in blood
 Week 9: Determination of (GOT)
 Week 10: Determination of (GPT)
 Week 11: Determination of vitamin C in blood, fruit and Vegetable
 Week 12 : Determination of Lactate dehydrogenase (LDH)
 Week 13: Determination of Creatine Kinase (CK)
 Week 14: Determination of Alkaline phosphatase

Dr. Zeyan
Le. Peshtewan

19. Examinations: Q1/ Explain how you can distinguish between 1- Monosaccharide and disaccharide 2- Pentose and hexose sugar 3- Starch and glucose 4- Galactose and mannose 5- Glucose and fructose Q2/ put true or false: 1- Reducing sugar is a sugar which has free carbonyl group. 2- Ribose gives positive with benedekit test. 3- Tyrosine give negative with sakagushe test Q3/ Choice the correct answer: 1- Hydrolysis of polysaccharides obtained by: a- Iodine test b- Benedict test c- Selewanof test d- Bial test Q4/ Define: 1- Non reducing sugar 2- Polysaccharides 3- Acid hydrolysis of starch	
20. Extra notes:	
21. Peer review 	
<i>Dr. parween Abdulsamad</i>	