

**Department of Soil and Water**

**College of Agriculture University of Salahaddin**

**Subject: Biochemistry**

**Course Book -for Year 2 Lecturer's name PhD: Dr. Safaa Fahmi Ahmad**

**Academic Year: 2019/2020**

**Course Book**

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| **1.Course Name** | **Plant biochemistry** | | | **Organic Chemistry** |
| **2.Lecturer in charge** | **Dr. Safaa Fahmi Ahmad** | | | **Dr. Safaa Fahmi Ahmad** |
| **3.Department/Collage** | **Field crop, Collage of Agricultural engineering science** | | | **Soil Science, Collage of Agriculture** |
| **4.Contact** | **E-mail: safaa. ahmad@gmail.com**  **Tel: -** | | | **e-mail: safa Time in (hours) peTime in (hours) per week week @yahoo.com**  **Tel: -** |
| **5.Time (in hours) per week** | **Theory: 2**  Practical:3 | | | **Theory: 2+3** |
| **6.Office hours** | **8hours/week** | | | **Dr.** |
| **7.Coursecode**  **8.Teachers academic**  **Profile**  **9.Keywords:** | **BSc. Homs university-college of science**  **Department of chemistry (1981).**  **MSc. USSR .Odessa State University (1984).**  **Ph.D. USSR-Odessa State University (1988).**  **I participated in national and international conferences.**    In Biochemistry the chemical properties of different and important biological molecules which takes into account like proteins is studied in particular with the chemistry of enzyme-catalyzed reactions. | | | **Tel:** |
|  | In addition to basic biochemistry, students will acquire information emphasizing cell, carbohydrate, lipids, proteins, enzymes, vitamins, nucleic acids and general metabolic pathways of these macromolecules. | | |  |
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| **11-Course Objectives:**   1. Quite simply, biochemistry is the chemistry of living things. More precisely, the chemistry of living cells. Living cells are really nothing more than an isolated aqueous environment where a series of chemical reactions occur. The reason biochemistry is important in terms of medicine is because, for example, many drugs exert their influence by altering cell chemistry, or biochemistry. Thus, it is important to understand biochemistry in order to understand how many drugs function. In addition, many diseases, such as cancer, can be described in terms of biochemical changes in the cell that lead to changes in gene expression and cell physiology. Thus, if you can determine the biochemical changes that led to some disease state, perhaps you can design drugs to target those changes, and return cells to a "normal" state (in other words, reverse the disease state and restore health). 2. Students from different departments will gain the basic biochemical knowledge necessary to meet the institutional objectives and goals for general biochemistry. In addition to basic biochemistry, students will acquire information emphasizing cell, carbohydrate, lipids, proteins, enzymes, vitamins, nucleic acids and general metabolic pathways of these macromolecules. 3. [Biochemistry](file:///G:\q851623.html) is defined as the chemistry of living beings. It studies the chemical processes that take place in living organisms. If taken into broader view it is the chemistry related to living cells. Biochemistry plays an important role in the field of medicine as we know that drugs impact and have different reactions on cell and this in turn influences the biochemistry. In Biochemistry the chemical properties of different and important biological molecules which takes into account like proteins is studied in particular with the chemistry of enzyme-catalyzed reactions. | | | |
| **12.Students obligation:**  **All students must abide by the rule and regulations of the ministry of higher education and scientific research in which attendance is the most significant one. Also the student at every lecture should ready to quick test (quiz) of previous lecture, whereas they asked about what we talked and studied in previous lecture.**  **13. Forms of teaching: Data show (Power point), magic (white) board, discussion and allow students to write some problems on the board and assignments.**  **1 4.Assessment scheme: The students are required to do 2 closed book exams during of the study course, classroom activities and quizzes and practical exams (40marks).There will be a final exam on (60marks)**  **15.Student learning outcome:**  Student Learning Outcomes: Upon completion of this course, the student will be able to  **Understand how atoms combine in covalent molecules, coordination complexes and ionic solids, and understand the importance of the 3-D arrangements of atoms and ions in these molecules. Students should also be aware of the interactions between ions, atoms, molecules and other bonded collections of atoms.**  **[Structure and Bonding]**  **. Understand the principal laws of thermodynamics and how these dictate the behavior of chemical substances. Students must also understand how the thermodynamic information about chemical and physical changes helps to shape understanding of interactions between atoms, molecules, and other ensembles of particles.**  **Understand how the study of the rates of chemical reactions and the structures of the products of these reactions can lead to knowledge of the detailed atomic-level behavior of chemical substances and elucidation of their chemical and physical properties.**  **[Mechanisms of Reactions] . Use their knowledge of chemical reactivity to plan and execute the preparation of compounds from common starting material .**  **[Synthesis]**  **Understand the fundamental physical and chemical principles involved in instrumental chemical analyses. Students must understand the chemistry relevant to sampling and sample preparation and must apply these to the successful operation of instruments regardless of model or manufacturer.**  **[Chemical Instrumentation]**  **Students will demonstrate an understanding of major concepts in all five major disciplines of chemistry: analytical, biochemistry, inorganic, organic and physical.**  **Students will employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments.**  **Students will demonstrate proficiency in the use of appropriate instrumentation to collect and record data from chemical experiments.**  **Students will demonstrate proficiency in the use of appropriate library searching and retrieval methods to obtain information about a topic, chemical, chemical technique, or an issue relating to chemistry.**  **Students will demonstrate proficiency in writing and speaking about chemistry topics in a clear and concise manner to both chemists and non-chemists according to professional standards.**  **Students will know and follow proper procedures and regulations for safe handling, use, and disposal of chemicals.**  **Students will demonstrate an awareness of the impact of chemistry on the environment, society, and other cultures outside the scientific community.**  **Students will effectively and respectfully communicate and collaborate with colleagues.**  **Students will contribute their own knowledge and experiences to their community and the broader society by participating in professional and/or community activities.**  **Students will demonstrate understanding of structure, chemical properties, and reactions of the biomolecules and their biopolymers.**  **16-Course Reading list and References: -**  **Key references:**  1-General organic and Bio chemistry ,Katherine J: Dennison , Joseph J. Topping, Robert Caret ,Dennison Topping Caret Firth Edition ,2007  2-Biochemistry ,Ankara Naik, Jayvee Brothers Medical Polishers(P) LTD, third edition ,2010  - -أساسيات الكيمياء الحيوية ,د.باسل كامل دلالى,دار الكتب والطباعة والنشر الموصل-19943  -الكيمياء الحياتبة التطبيقية ,د.دلاور محمد صابر ود.ميسون بشير شام,جامعة صلاح الدين 1991 4  The internet researches. **Useful References: -**  The internet researches. | | | |
| **17-The Topics: -** | | | **Lecturer name** |
| Introduction to biochemistry ,importance ,  Of biochemistry , theory of cell . | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Carbohydrate chemistry , Introduction , Definition , Functions of  Carbohydrates , Classification and nomenclature of carbohydrate. | | | Dr. Safaa Fahmi Ahmad  (2hrs) |
| Carbohydrate chemistry , Fischer Projections,  Haworth projection Formula ,Isomerism,  D and L isomerism ,stereoisomerism,  Anomerism,optical isomerism, epimerism,  Chemical properties of monosaccharide,  interaction. | | | Dr. Safaa Fahmi Ahmad  (4 hrs) |
| Chemical properties of monosaccharide, importance ,disaccharide , polysaccharides.  interaction . | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Amino acid chemistry ,classification of amino acids , importance , interaction . | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Chemistry of lipid , Introduction ,classification of  Lipids ,reactions of lipids , importance , interaction. | | | Dr. Safaa Fahmi Ahmad  (2 hrs |
| Exam | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Fatty acid .classification of fatty acids,  Functions of fatty acids , importance ,  , | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Chemistry of proteins ,chemical properties of amino acids | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Peptides , Important peptides . | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Nucleic acid , importance . | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Exam | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| Vitamins , importance . | | | Dr. Safaa Fahmi Ahmad  (2 hrs) |
| 18.Practical Topics: | | |  |
| 19-Examinations: -  In regard to this subject the type of exam will be as follows: -   1. **Multiple choice questions.**(1) The numbers isomers compound ketoses: 2. nothing . b. one. C. two.   d. None of these **The answer**: - (a)  2. How money number of isomer in compound .  Aldohexose the answer :(16 ) isomer  =4 C atoms  2n =16 2=number isomers = 2n  3.What are the types of ( Isomers)  The answer 1- Mirror image 2-Epimert  3-Optical isomers  The exam disturbed due students level as following: -   * Fair (10%) * Intermediates (40%) . Very Good (20%) * Good (20%) . Excellent (10%)   **20. Extra notes:**  **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ** | | | |