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**Department of chemistry**

**College of Education**

**University of Salahaddin**

**Subject: practical organic chemistry**

**Course Book – *2nd stage***

**Lecturer's name: MSc. Marlin Yousif Aziz,**

**Academic Year: 2023-2024**

**Course Book**

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| **1. Course name** | **Practical organic chemistry** |
| **2. Lecturer in charge** | **Marlin Yousif Aziz** |
| **3. Department/ College** | **Chemistry/ Education** |
| **4. Contact** | **e-mail:Marlin.aziz@su.edu.krd****Tel:**  |
| **5. Time (in hours) per week**  | **Practical: 6 hrs.** |
| **6. Office hours** | **Monday 9:30 1:30 or by appointment** |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | **Education:****M.Sc. in Organic Chemistry**, University of Salahaddin-Erbil, 10/2008 - 05/ 2011 *Thesis:* Synthesis and Spectroscopic Identification of a New Series of 1, 2, 4-Triazole Derivatives. ***Supervisor****:* Dr. Hashim Jalal Aziz. **Assist. Chemistry**, 12/10/2005- 18/10/2008 **B.Sc. in Chemistry**, Rank (1), July 2005.**Teaching Experience:**lecturer, University of Salahaddin-Erbil, Chemistry Department, Organic chemistry *Lab.*, 2014 – PresentLaboratory instructor for undergraduate chemistry and Biology Dept. Basic principle in organic chemistry for 2nd stage of chemistry and 1st satage of Biology departments. Organic Identification for 4th stage of chemistry. **Conference Paper:**Synthesis and Spectroscopic Identification of a New Series of 1, 2, 4-Triazole Derivatives. 4th International Scientific Conference Of Salahaddin University-Erbil, October 18-20, 2011.**No. of Publications:** (1). |
| **9. Keywords** | **Purification of solid compounds, Purification of liquid compounds, detection of elements, detection of functional groups**  |
| **10. Course overview:** Organic chemistry is a branch of chemistry that focuses on a single element carbon. Carbon bonds strongly with other carbon atoms and with other elements, forming numerous chain and ring structures.Most of the laboratory operations of organic chemistry have to do with the preparation, the purification, or the characterization of compounds and there is some grouping of the experiments given below according to this classification. The first few sections deal largely with the common methods of purifying organic substances, and the preparations which follow require constant use of these methods in the separation of the reaction product from the by-products and tars almost invariably formed in the course of the reaction. We will also look at synthetic strategies for making simple, small organic molecules, using the knowledge of organic chemistry accumulated thus far and recognize the mechanisms behind a chemical reaction.  **It is an excellent plan to make some entries in the notebook** In advance of the laboratory period in case the experiment is in the nature of a preparation, this can include a suitable heading, a reference to the procedure which is to be followed, the equations involved, a diagram of the apparatus to be used and a summary of the quantities of reagents required. This will save much time in getting the experiment under way and the notebook will be in good shape for the recording of observations as they are made. Whatever further directions regarding the taking of notes may be issued by the instructor it is well to remember that only original notes recorded at the time of making the observations have any value in actual scientific practice. |
| **11. Course objective:**The lectures cover laboratory safety, keeping an organic laboratory notebook, basic laboratory operation , melting point determination, recrystallization, , sublimation and the separation and purification of organic compounds (simple, fractional, vaccum and steam distillation), solvent extraction. And rudimentary organic synthesis and elements and functional groups detections are performed.**The specific objectives of the study were:**1. To evaluate the types of objectives of the selected activities2. To assess the inquiry levels assigned to the laboratory tasks3. To measure the relevance of the activities in terms of the recent concern, Students in order to achieve these objectives, the study posed the following research |
| **12. Student's obligation**The students should attened all the lectures, shouldn't be absent in final exam and should pass the final exam. Chemistry laboratory activities refer to the practical activities which students undertake using chemicals and equipments in a chemistry laboratory. Inquirylevelis a multifaceted activity that ***involves making reports, weekly quiz observations posing questions, planning investigations; reviewing what is already known in light of experimental evidence***, using tools to gather, analyze, and interpret data; proposing answers, explanations, predictions and communicating the results. |
| **13. Forms of teaching**The principal learning outcome of demonstration activities is to help the student realize the theoretical understanding of the course ***for this reason we use white board for explanation of concepts and using chemicals, equipments and apparatus for building product.*** |
| **14. Assessment scheme**

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| **The overall rank for Organic chemistry lab. Is divided in the following scheme** |
| **typeAssessment** | **Reports** | **Quizzes**  | **Final exam** | **overall** | **activity** |
| **Degree** | **8** | **6** | **20** | **34** |  |

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| **15. Student learning outcome:**1. Students will be able to understand the objective of their chemical experiments, properly carry out the experiments, and appropriately record and analyze the results. 2. Students will be able to use standard laboratory equipment, modern instrumentation and classical techniques to carry out experiments. 3. Students will know and follow the proper procedures and regulations for safe handling and use of chemicals. 4. Students will be able to communicate the concepts and results of their laboratory experiments through effective writing and oral communication skills. 5. Opportunity to discuss, to consult with one another and to criticize and be criticized6. Increased efficiency by division of labor.7. Opportunity to compare results and to interpret data within the group. |
| **16. Course Reading List and References‌:**1. Experimental organic chemistry by James F. Norris, second edition
2. Practical organic chemistry by B S. Furniss and et al. (vogel), fifthedition.
3. Experiments Organic by Louis. F. Fieser and Kenneth L. Williamson seventh edition.
4. Practical Organic chemistry By F. G. MANN and B.C.Saunder, 4th Edition, Longman, 1974.
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| **17. The Topics:** | **Lecturer's name** |
|  | Lecturer's nameex:(2 hrs) |
| **18. Practical Topics (If there is any)** |  |
| **Week 1****Melting point****Week 2** **Recrystallization** **Week 3** **Sublimation****Week 4****Simple Distillation****Week 5****Fractional Distillation****Week 6** **Vacuum Distillation****Week 7** **Steam Distillation****Week 8** **Solvent Extraction** **Week 9** **Preparation of Methane****Week 10****Preparation of ethylene****Week 11****Preparation of acetylene****Week 12****Detection of elements****Week 13****Detection of Alcohols****Week 14****Detection of Phenols** | Marlin YousifEach lecture is (2 hrs) |
| **19. Examinations:****1-Compositional:****Examples:**1. What are the properties of solvent choosed for recrysallization?
2. Comparebetween simple distillation and fractional distillation?
3. Why sublimation method is better than recrysallization method for purification of solid organic substances?

 d-Complete the following equations:**Detect true & false for each of the following:****Examples:**1. If a sample of benzoic acid (m.p. 121-122 degrees C) has become contaminated with a small amount of urea (m.p. 133-134 degrees C), a soluble impurity, its melting point range would be expected to be raised and narrowed, true or false?.
2. A mixture of 95% ethanol and 5% water can be separated by simple distillation, true or false?.

**Choose the correct answer for each of the following:****Examples:** Th 1- The liquid to be distilled should fill the distillation flask to --------------. a) a) 2to 1/3 b) 1/2 to 2/ c) 1/2 to 3/3 d)2/3/ to 3/41. 2- Liebermann test is used for detection of phenols which have a free-------- position.
2. meta b) ortho c) para d) (a) or (b)
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| **20. Extra notes:** |
| **21. Peer reviewپێداچوونه‌وه‌ی هاوه‌ڵ**  |