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**Department of chemistry**

**College of Science**

**University of Salahaddin-Erbil**

**Subject: Organic Chemistry**

**Course Book – stage 2**

**Lecturer's name: Dr. Hawraz Ibrahim M. Amin**

**Academic Year: 2016/2017**

**Course Book**

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| **1. Course name** | **Practical Organic Chemistry** | |
| **2. Lecturer in charge** | **Ph.D. Hawraz Ibrahim M. Amin** | |
| **3. Department/ College** | **Science \ Chemistry** | |
| **4. Contact** | **e-mail: hawraz.mohammedamin@su.edu.krd**  **Tel: (07504478209)** | |
| **5. Time (in hours) per week** | **Practical: 12 hours** | |
| **6. Office hours** | **Tuesday 9-12**  **Thursday 9-11** | |
| **7. Course code** | **Practical Organic Chemistry** | |
| **8. Teacher's academic profile** | **1- B.Sc. in general chemistry from Salahaddin University\ college of Science \ Chemistry department.2007**  **2- M. Sc. In Organic Chemistry \ Pavia University-Italy .2011**  **3- Ph.D. In Organic Chemistry \ Salahaddin University\ College of Science.2016** | |
| **9. Keywords** | **Synthesis, natural product, Biologically active organic compounds** | |
| **10. Course overview:**  The major objective of this study was to offer an overview of the current situation in the course practical organic chemistry in chemistry department\ college of Science. All second year chemistry students, laboratory instructors and Practical Organic Chemistry course material were involved as the main source of data. Laboratory activities have had a distinctive and central role in the science curriculum and science educators have suggested that many benefits mount up from engaging students in science laboratory activities, science cannot be meaningful to students without worthwhile practical experiences in laboratory. Laboratories are one of the characteristic features in the sciences at all levels. It would be rare to find any science course in any institution of education without a substantial component of laboratory activity.  It is important to think about goals, aims and objectives in the context of laboratory work.  Science teaching in universities is often criticized for being prescribed, impersonal, lacking an opportunity for personal judgments and creativity. Science has become reduced to a series of small, apparently trivial, activities and pieces of knowledge mostly unrelated to the world in which students are growing up and inhibiting to their developing personalities and aspirations.  Scholars identify three distinct types of practical work:  1. *Experiences*, which are intended to give students a ‘feel’ for observable fact;  2. *Exercises*, which are designed to develop practical skills and techniques; and  3. *Investigations*, which give students the opportunity to tackle more open-ended tasks like a problem-solving scientist. Some also classify practical works in to four major types: exercises, experiences, demonstrations and investigations. Each of these types of practical has its own place in science teaching. *Chemistry laboratory activities* refer to the practical activities which students undertake using chemicals and equipment’s in a chemistry laboratory. | | |
| **11. Course objective:**  The major objective of this study was to offer an overview of the nature of Practical  Organic Chemistry offered by the Department of Chemistry in Salahaddin University. The  specific objectives of the study were:  1. To evaluate the types of objectives of the selected activities  2. To assess the inquiry levels assigned to the laboratory tasks  3. To measure the relevance of the activities in terms of the recent concern, students’ interest and instructors reaction to what should be the objectives of the laboratory tasks. | | |
| **12. Student's obligation**  The role of students and their obligations throughout the academic year comes from  Evaluating them through exams, presence and activity in the Lab.  . | | |
| **13. Forms of teaching**  Learning resources in this course include white board and PowerPoint presentations. | | |
| **14. Assessment scheme**  Quiz = 2 marks  Activities, seminars and reports = 2 marks  First semester practical Exam. = 5 marks  Second semester practical Exam.= 5 marks  Student attendance= 1 marks  Total is equal to 15 marks  ‌ | | |
| **15. Student learning outcome:**  The principal learning outcome of demonstration activities is  to help the student grasp the theoretical understanding of the course and to demonstrate materials taught in lecture and promote interest in chemistry and in learning science and introduce equipment’s and develop observational skills. | | |
| **16. Course Reading List and References‌:**     1. Louis F. Fieser and Kenneth L Williamson, 0rganic Experiments, Seventh Edition, D. C. HEATH AND COMPANY. 2. Brian S. Furniss and others, VOGEL's TEXTBOOK OF PRACTICAL ORGANIC CHEMISTRY, FIFTH EDITION, Revised by former and current members of The School of Chemistry, Thames Polytechnic, London. 3. R. L. shriner and others, the systematic identification of organic compounds, john wiley and Sons, USA. | | |
| **17. The Topics:** | | **Lecturer's name** |
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| **18. Practical Topics (If there is any)** | |  |
| **Experiment titles for the first semester:**   1. Introduction to general practical organic chemistry 2. Laboratory equipment , Safety topics 3. Recrystallization (purification of contaminated sample of organic compounds by recrystallization). 4. Determination of melting points (determination of the melting point of a substance purified by recrystallization. 5. Simple distillation (purification of a contaminated liquid by simple distillation). 6. Fractional distillation (fractional distillation of liquid mixtures) 7. Sublimation 8. Extraction of Caffeine from tea 9. Determination of boiling point of liquid organic compounds 10. Fusion of sodium 11. Solubility behavior of organic compounds   **Experiment titles for the second semester:**   1. Preparation of aspirin 2. Preparation of soap 3. Synthesis of Salicylic Acid from Oil of Wintergreen 4. Preparation of p-acetaminophen(paracetamol) 5. Nitration of ethyl benzoate 6. preparation of benzoic acid 7. Preparation of acetanilide 8. Preparation of p-nitroacetanilide 9. Preparation of p-nitroaniline 10. Preparation of diazonium salts and azo dyes 11. Nitrosation of phenol(Liebermann reaction) | |  |
| **19. Examinations:**  **1- What is the importance of using boiling chips in distillation?**  Boiling chips are small, insoluble, porous stones made of calcium carbonate or silicon carbide. These stones have pores inside which provide cavities both to trap air and to provide spaces where bubbles of solvent vapor can form. These bubbles ensure even boiling and prevent bumping and boiling over and loss of the solution.  Boiling chips  Note: Always use a boiling chip when heating a solvent. Never add a boiling chip to a solvent which is already hot, because it can cause to solvent to boil over violently. If you forget to add a boiling chip before you begin, you must cool the solution before adding one to prevent product loss. Boiling chips cannot be re-used since the pores inside these stones become filled with liquid on cooling.   1. What is distillation?   Distillation is the process of heating a liquid until it boils, then condensing and collecting the resultant hot vapors In the modern organic chemistry laboratory, distillation is a powerful tool, both for the identification and the purification of organic compounds. The boiling point of a compound is one of the physical properties used to identify it. Distillation is used to **purify a compound** by separating it from a non-volatile or less-volatile material. When different compounds in a mixture have different boiling points, they separate into individual components when the mixture is carefully distilled. so Distillation for Boiling Point Determination and for Compound Purification  ***2.******True or false type of exams:***  1- Oxalic acid is soluble in water. (False)  2- Intramolecular hydrogen bonding increase boiling point of a liquid. (False)  3- Increasing polarity increase the melting point. (True)  ***3. Multiple choices:***  1- The transition of a substance from the solid phase to the gas phase without passing through an intermediate liquid phase called   1. Recrystallization b- **sublimation** c- evaporation d- condensation | | |
| **20. Extra notes:** | | |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ**  ئه‌م کۆرسبووکه‌ ده‌بێت له‌لایه‌ن هاوه‌ڵێکی ئه‌کادیمیه‌وه‌ سه‌یر بکرێت و ناوه‌ڕۆکی بابه‌ته‌کانی کۆرسه‌که‌ په‌سه‌ند بکات و جه‌ند ووشه‌یه‌ک بنووسێت له‌سه‌ر شیاوی ناوه‌ڕۆکی کۆرسه‌که و واژووی له‌سه‌ر بکات.  هاوه‌ڵ ئه‌و که‌سه‌یه‌ که‌ زانیاری هه‌بێت له‌سه‌ر کۆرسه‌که‌ و ده‌بیت پله‌ی زانستی له‌ مامۆستا که‌متر نه‌بێت.‌‌ | | |