



## **Postgraduate Course Book**

**Department: Chemistry**

**College: Education College**

**University: Salahaddin University**

**Subject: Advanced Industrial Chemistry**

**Course Book Level: M.Sc.; second semester**

**Lecturer's name: Dr. Dler Kurda**

**Academic Year: 2023/2024**

## Course Book

<b>1. Course name</b>	Research Methodology
<b>2. Lecturer in charge</b>	Dr. Dler Kurda
<b>3. Department/ College</b>	Chemistry
<b>4. Contact</b>	e-mail: <a href="mailto:dlr.kurda@su.edu.krd">dlr.kurda@su.edu.krd</a>
<b>5. Time (in hours) per week</b>	Theory: 2hrs
<b>6. Office hours</b>	<b>Saturday 11 am – 1 pm</b>
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	<p>Full Name: Dler Dlshad Kurda Rawanduze</p> <p>Date of Birth: 15/3/1976</p> <p>I became one of the academic staff at the University of Salahaddin about 23 years ago and graduated from the Faculty of Science Department of Chemistry in the 1996-1997 academic year. Then I was appointed as a University Teaching assistant in 1999 and was accepted in the 2001 M.Sc studies, and got a master's degree in 2003 in the specialty of Industrial organic chemistry ...</p> <p>In 2009-2010 I accepted a Ph.D. and got a Ph.D. in polymer specialization in 2014 ...</p> <p>On 4/9/2023, I was promoted from Lecturer to assistant professor in Induintoustrial Organic Chemistry - Polymer Synthesis</p> <p>In 2020-2023 Head of Chemistry Department</p> <p>From the 2023 till now the Director of the Higher Education and Scientific Affairs unit</p> <p>Participated in many scientific seminars, Symposium, and cultural and sports gatherings</p>
<b>9. Keywords</b>	<b>Industrial Chemistry definitions , Safety consideration, Surfactants, Drug Chemistry , Colorant, Catalysis.</b>

**This course is designed to:**

- Focus on the design of reactors in Industrial factory.
- Safety consideration.
- Introduce to different industrial products.
- Explain the main properties of industrial products.

**11. Course objective:**

To provide students with a thorough grounding in principles and sound knowledge of scientific methods of the chemical sciences.

Arouse a sense of curiosity and enquiring mind, in order to encourage and develop creative thinking and research aptitudes.

Generate in students an awareness of the enormous resources in their immediate environment so as to enhance solutions to the challenges of our time in a march towards nation building.

Inculcate in students appropriate skills and abilities to manage and administer technological operations within the field of chemistry and allied areas;

To educate, train and produce chemists, who are technically innovative and self-reliant, having a meaningful picture of the chemical industry.

Prepare students for professional participation in chemical industries.

**12. Student's obligation**

The student attendance in class two hours a week + Seminar+ preparation of the home works using computer

**13. Forms of teaching**

Different forms of teaching will be used to reach the objectives of the course: Seminar, Direct questions, Quizzes, Discussion and conclusions. Power point presentations

**14. Assessment scheme**

Weekly quizzes during the course (5pts). Participation in class and activities (5pts) midterm (20pts)+ review article(15)+ Seminar(5) & Final 50%.

**15. Student learning outcome:**

At the completion of this course, students should be able to:

- Understand the basic concepts and laws of the three modes of heat transfer;
- Understand and use empirical equations to solve forced and natural convection heat-transfer problems;
- Solve simple radiation heat transfer problems;
- Analyse the heat transfer processes involved in boiling and condensation;
- Design common heat exchangers like double pipe and shell & tube to determine relevant design parameters
- Identify and understand the unit operations involved in a process
- Solve materials and energy balances alone and simultaneously on chemical process systems

<p><b>16. Course Reading List and References:</b>                  Ribes, Carolyn. "Strategies for Success as an Industrial Chemist." Chemistry International 43, no. 3 (July 1, 2021): 4–7. <a href="http://dx.doi.org/10.1515/ci-2021-0302">http://dx.doi.org/10.1515/ci-2021-0302</a>.                  Marmor, Solomon. "Industrial chemistry bibliography." Journal of Chemical Education 62, no. 4 (April 1985): 331. <a href="http://dx.doi.org/10.1021/ed062p331">http://dx.doi.org/10.1021/ed062p331</a>.</p>	
<p><b>17. Topics Program</b></p>	<p>Lecture's Name</p>
<p><b>Week 1:</b> Industrial Chemistry Definition, relationship with other science</p>	
<p><b>Week 2:</b> Industrial process design, Continuous and Batch Process</p>	
<p><b>Week 3: Physical and Chemical processes, safety consideration</b></p>	
<p><b>Week 4:</b> Catalysis</p>	
<p><b>Week 5:</b> Environmental Chemistry and Environmental pollution</p>	
<p><b>Week 6:</b> Development and Discovery</p>	
<p><b>Week 7:</b> Quality control and Quality Assurance</p>	
<p><b>Week 8:</b> Validation process</p>	
<p><b>Week 9:</b> ISO stages</p>	
<p><b>Week 10:</b> Surfactants</p>	
<p><b>Week 11:</b> Corrosion Chemistry</p>	
<p><b>Week 12:</b> Chemistry of colorants.</p>	
<p><b>Week 13:</b> Drug Design</p>	
<p><b>Week 14:</b> Drug administration</p>	
<p><b>18. Grading procedure</b>                  Seminar+ Reports+Review articles+ Quizes+ Midterm exam...+ Final</p>	

**19. Examinations:**

**Q1/ What are the examples of negative catalysts? 20pts**

Catalyst:

A catalyst is defined as any substance that alters the rate of reaction.

Usually, a catalyst increases the speed of the reaction.

A catalyst can be categorized into two types:

Positive catalyst

Negative catalyst

Negative catalyst:

The catalyst that decreases the rate of reaction is known as a Negative catalyst.

The rate of reaction decreases by increasing the activation energy which further decreases the number of reactant molecules.

Examples:

Alcohol acts as a negative catalyst in the oxidation of Sodium sulfide

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Phosphoric acid

serves as a negative catalyst in the decomposition of Hydrogen peroxide

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**20. Extra notes:**

The student must follow attendance policy that given by the university.

- The student is responsible to read all announcements that are regularly posted by the instructor.
- Any student having difficulty understanding this handout should contact the instructor for clarifications.
- For all enquiries, students should contact the instructor.

**21. Peer review \***

\* Must have permission of the Scientific and Higher Education Committee