

**School of Chemistry
Faculty of Science
University of the Punjab, Lahore
Course Outline**



BS Chemistry Semester-VI					
Programme	BS Chemistry	Course Code	Chem-363	Credit Hours	2
Course Title	Unit Processes and Raw Materials		Course Type	Major (Elective)	
Course Introduction					
<p>This course will help the students in assessing the Unit processes in Organic Industries. The students will learn about the basic raw materials and their applications in chemical industries.</p> <p>Industrial Unit processes: Introduction, agents, mechanism, general procedure and application of Nitration; Halogenation; Sulphonation; Esterification and Oxidation.</p> <p>Basic industrial raw materials: Origin/Source, Properties, Chemistry and industrial applications of Acetylene, propylene, Ethylene, BTX, Naphthalene, Butadiene and Styrene.</p>					
Learning Outcomes					
<p>On the completion of the course:</p> <ul style="list-style-type: none"> • Students are expected to become familiarized with the concepts of general chemistry. • This will enable them qualify for basic to moderate level jobs involving general knowledge of Chemistry. • The obtained knowledge shall also enable the students to enter into various entrepreneurial activities involving general introduction to chemistry • Students are able to understand the concept of GLP and GMP 					
Course Content			Assignments/Readings		
Week 1	Introduction, agents, mechanism, general procedure and application of Nitration		Class Based learning/tests		
Week 2	Introduction, agents, mechanism, general procedure and application of nitration		Class Based learning/tests		
Week 3	Introduction, agents, mechanism, general procedure and application of Sulphonation		Class Based learning/tests		
Week 4	Introduction, agents, mechanism, general procedure and application of Sulphonation		Class Based learning/tests		
Week 5	Introduction, agents, mechanism, general procedure and application of Esterification		Class Based learning/tests		
Week 6	Introduction, agents, mechanism, general procedure and application of Esterification		Class Based learning/tests		
Week 7	Introduction, agents, mechanism, general procedure and application of oxidation		Written Assignment		
Week 8	Introduction, agents, mechanism, general procedure and application of oxidation		Class Based learning/tests		
Week 9	Midterm Assessment		Class Based learning/tests		

Week 10	Origin/Source, Properties, Chemistry and industrial applications of Styrene.	Class Based learning/tests
Week 11	Origin/Source, Properties, Chemistry and industrial applications of Acetylene	Class Based learning/tests
Week 12	Origin/Source, Properties, Chemistry and industrial applications of Propylene	Class Based learning/tests
Week 13	Origin/Source, Properties, Chemistry and industrial applications of Ethylene	Class Based learning/tests
Week 14	Origin/Source, Properties, Chemistry and industrial applications of BTX	Class Based learning/tests
Week 15	Origin/Source, Properties, Chemistry and industrial applications of Naphthalene	Quiz
Week 16	Origin/Source, Properties, Chemistry and industrial applications of Butadiene	Class Based learning/tests

Textbooks and Reading Material

1. Applied Chemistry, Haq Nawaz Bhatti and Muhammad Salman, 2017, Caravan Book Publisher, Pakistan.
2. Water Supply and Sewerage, T.J.McGhee, McGraw Hill Book Co. New York.(1991)
3. Hand Book of Industrial Chemicals, By SIRI Board of Consultants and Engineers,
4. Shereve's Chemical Process Industries, 5th Ed.1975 by G.T.Austin McGraw Hill Book Co. New York.
5. Industrial chemistry, B. K. Sharma Krishna Prakashan Media (P) Ltd., Ed-15 (2006).

Teaching Learning Strategies

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

Assignments: Types and Number with Calendar

1. Written 7th week
2. Quiz 15th week

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

Semester-VI					
Programme	BS Chemistry	Course Code	Chem-364	Credit Hour	1
Course Title	Applied Chemistry Lab		Course Type	Major (Elective)	
Course Introduction					
<p>This course content will increase the working skills of students regarding water testing labs and cosmetic industries.</p> <p>Spectrophotometry: Determination of the of KMnO_4, $\text{K}_2\text{Cr}_2\text{O}_7$ and CoCl_2 (λ_{max} and Beer's law verification) Preparations: Preparations of Cold Cream, Vanishing Cream, Cream Shampoo Titrations: Determine the %age Purity of Impure NaCl, Determine the Carbonate and Non-carbonate Alkali in water.</p>					
Learning Outcomes					
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Course Content				Assignments/Readings	
Week 1	Preparation of Cold Cream			Lab work / Notebook	
Week 2	Preparation of Cold Cream			Lab work / Notebook	
Week 3	Preparation of Vanishing Cream			Lab work / Notebook	
Week 4	Preparation of Vanishing Cream			Lab work / Notebook	
Week 5	Preparation of Cream Shampoo			Lab work / Notebook	
Week 6	Preparation of Cream Shampoo			Lab work / Notebook	
Week 7	Determine the %age Purity of Impure NaCl			Written Assignment	
Week 8	Determine the %age Purity of Impure NaCl			Lab work / Notebook	
Week 9	Mid Term Examination			Lab work / Notebook	
Week 10	Determine the %age Purity of Impure NaCl			Lab work / Notebook	
Week 11	Determination of Carbonate Alkalies			Lab work / Notebook	
Week 12	Determination of non-Carbonate Alkalies			Lab work / Notebook	
Week 13	Determination of Potassium in water			Lab work / Notebook	
Week 14	Determination of the of KMnO_4 (λ_{max} and Beer's law verification)			Lab work / Notebook	
Week 15	Determination of the of $\text{K}_2\text{Cr}_2\text{O}_7$ (λ_{max} and Beer's law verification)			Quiz	
Week 16	Determination of the of CoCl_2 (λ_{max} and Beer's law verification)			Lab work / Notebook	

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